Connecticut Common School Journal.

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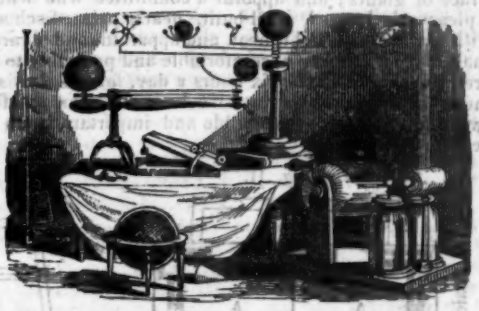
Fig. I.

Fig. VII.



SCHOOLHOUSES.

One of the most encouraging aspects of common school education at this time in this State, is the increasing interest manifested by parents and districts in the condition and improvement of the places where this education must be carried on. Three years ago, after visiting every county, we could not point to but one district schoolhouse, which in respect to location, construction and internal arrangement, could be safely recommended as a model. This* was at Greenville, in Norwich, and was built in 1838. Even the academies and private schools, although in general properly located, and expensively built, were objectionable in the arrangement of seats and desks, and in the mode of lighting, warming and ventilating. Since that time, more schoolhouses have been repaired and new ones built according to approved principles, than for twenty years previous. Among the best specimens of schoolhouse architecture which have been recently erected, we can refer to the Academy buildings in Bethlem, Norfolk, New Hartford, Warren, Haddam, Lyme, the Grammar school at New Haven, and to the District school, [Whiting st.] New Haven, Do., [North and South districts,] Hartford, Brooklyn, Sterling, Groton, [Portersville,] New London, Norwich, [Greenville,] Waterbury, Southbury, Newtown, [Sandy Hook,] Winsted, [Clifton,] Windsor, [in Poquonock and district No. 6.]

We were consulted in reference to the last, and our views have been carried out by the building committee, as far as could be done with a proper regard to the size and ability of the district. The cost of the building and land to the district will be about $1000. The Library, apparatus and maps were presented by individuals, and cost about $200.

It was thought desirable to open the schoolhouse with appropriate exercises, and in company with Governor Ellsworth and others, we were invited to be present and take part in the exercises of the occasion. An account of the proceedings having been communicated by some one who was present, to the Congregational Observer, we were requested to communicate a copy of our remarks for publication in that paper, which we did from time to time as they were called for. As the plan of this house is thought to embrace many desirable improvements, and as our remarks as written out embrace the best views we have been able to form on this subject, we republish them in the Journal with the introductory note to the Editors.

* For a description, see Journal, vol. 1, p. 193.

NEW DISTRICT SCHOOLHOUSE, WINDSOR.

Messrs. Editors:—

The accompanying cuts, executed by Mr. Clark, from drawings by Mr. Austin, represent the front and side elevation, and the ground plan of the new schoolhouse at Windsor, the opening of which was the occasion of the following remarks. These plans will, I trust, induce some of your readers to look into the district schoolhouses in their vicinity, to see if something need not, and cannot be done to make them more attractive, convenient and healthy. Taste, health and personal accommodation, have been consulted in the erection of new churches, hospitals, asylums, prisons, and poor-houses, dwelling houses, barns, stables, and every other structure intended for man or beast. And who regrets or complains of these improvements? Who would doom the criminals of the state again to the damp, unhealthy dungeons of the old Newgate prison? Who would think of herding them together in the half lighted and unventilated rooms of the old county jail? Who would send the afflicted and unfortunate of our race to retreats and asylums, which were repulsive without, and inconvenient and unhealthy within? Who would exchange a slip in any one of the new, tasteful, and commodious churches, which have been erected within ten years past in almost every town in the state, for a pew in the old, forlorn, dilapidated meeting house, where a good deal of sacred fire in the heart was needed to keep the outward man comfortable, and which indeed the "old mischief maker" has been accused of having had a hand in locating, building and seating, so as to make even the "old standards" who loved the house of prayer, love to leave it too, with as much eagerness as was becoming in good men? And why should not the same good sense, and good taste—the same spirit of reform and improvement characterize the action of the community in reference to schoolhouses?

If humanity and a wise economy demand that better care and accommodations should be provided for the criminal and the pauper, who are generally the victims of neglected or perverted education, why not do as much and more for the innocent children, and thus prevent them from becoming either paupers or criminals? If parents, acting as religious societies, have turned out the "old mischief maker" in order to furnish desk, and seats, and all other fixtures proper and comfortable for themselves and their pastor, for three hours of one day in the week, why not turn out the same committee-man, with his unseasoned and knotty materials, miserable plastering, half made window blinds, red paint pot, dilapidated stove, broken tongs and shovel, badly matched floor, slab seats without backs, and both seats and desks high enough to accommodate a race of giants; and appoint a committee who will provide a pleasantly located, well built, neatly painted school house, with seats, desks, light, heat, and apparatus and library, which shall make it attractive, comfortable and profitable to the children who are to spend six hours a day, for five or six days in the week, for thirty or forty weeks in the year, and for ten or twelve of the most susceptible and important years of their being?

I am happy in being able to point to at least one district which has acted in this spirit and erected a house which embraces most of the latest improvements in school house architecture. All of the buildings which have been erected within two years past, are superior to what before existed, but with many excellences, they embrace some of the radical defects of the old stereotyped school house.

Should any person or district refer to these plans, for models, they should remember that they were prepared for a small district, numbering only thirty-six children, and that the dimensions on the floor are small even for that number. If the district numbers over forty children, there should be a separate apartment for the small scholars, and in all cases, a class room, useful for various school purposes, should be provided.

The remarks which accompany these cuts I have written out from recollection, at your request, and have probably omitted some things that were said, and added others that were not said.

Yours truly,

HENRY BARNARD, 2D.

The house was built by Mr. James Burnham. District Committee, Mr. L. M. Smith. Building Committee, Messrs. Isaac Hayden, Samuel W. Ellsworth and Edward B. Munsell.

Fig. II.

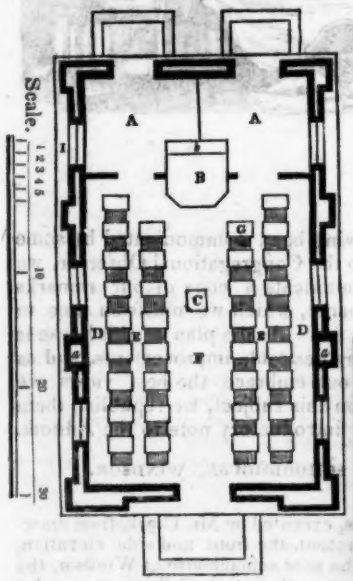


Fig. III.

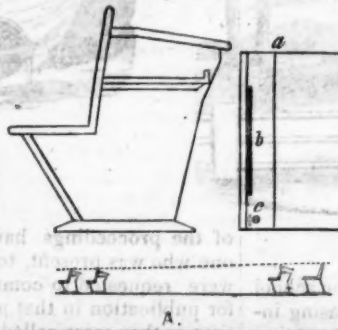
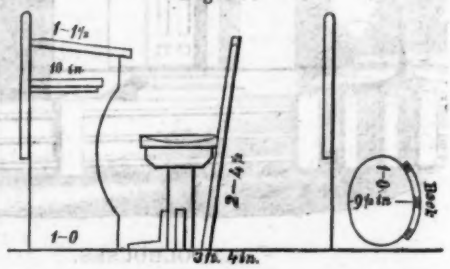
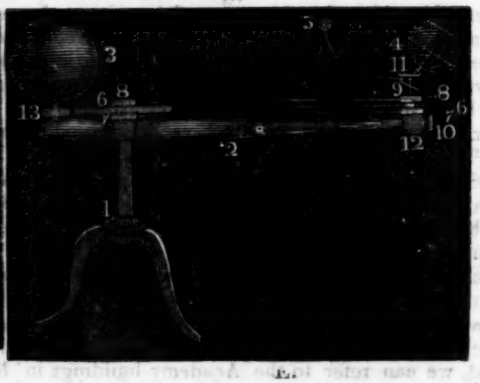


Fig. IV.

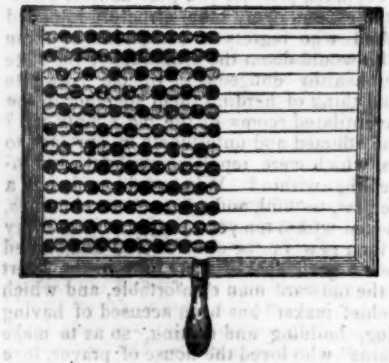


A.

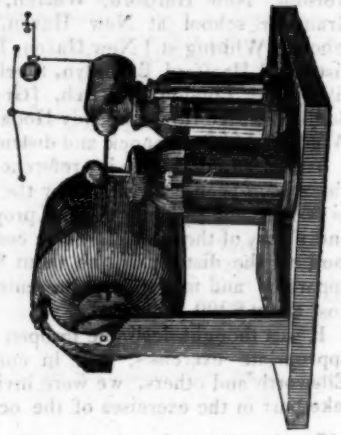
D.



C.



B.



EXPLANATION.

FIGURE I represents a perspective view of the front and one side.

FIGURE II represents the general arrangements of the interior.

FIGURE III represents an end view of one range of seats and desks.

Figure IV represents sections of a seat and desk lately introduced into the schoolhouses of Boston. A similar seat is used in all of the schools of Providence, except the pedestal is of cast iron. It would be an improvement in the modes of seating this and other schoolhouses, if each scholar was provided with a similar seat, detached from the adjoining desk.

Figure V represents a section of a sand desk, for small children, a specimen of which can be seen in the South district school, Hartford—*a* is an opening to receive a slate, *b*, a groove like space for a thin layer of sand. The sand can be smoothed by a broad brush, and be swept, when not wanted, into a draw at one end.

Figure VI represents a section of a gallery, or platform of seats rising one above another, as described on page 116—the lower seat is 6 1-2 inches and the higher 10 inches. A specimen of such a gallery can be seen in the primary department of the south district school, Hartford.

FIGURE VII represents a set of common school apparatus, as made by N. B. Chamberlain, Nos. 2 and 3 School street, Boston. Several of these articles are represented by Fig. A, (globe,) B, (orrery,) C, (numerical frame,) D, (Tellurium or season machine.)

The building stands 60 feet from the highway, near the centre of a dry, elevated, triangular shaped lot which slopes a little to the south and east. Much the larger portion of the lot is in front, affording a pleasant play ground, while in the rear there is a woodshed, and other appropriate buildings, with a separate yard for boys and girls. The walls are of brick, and are hollow so as to save expense in securing the antaes or pilasters, and to prevent dampness. This building is 33 feet 6 inches long, 21 feet 8 inches wide, and 18 feet 9 inches high from the ground to the eaves, including 2 feet base or underpinning. The freize and cornice are of wood.

The entries AA, one for boys and the other for girls, are in the rear of the building, through the woodshed, which with the yard is also divided by a partition. Each entry is 7 feet 3 inches, by 9 feet 3 inches, and is supplied with a scraper and mat for the feet, and shelves and hooks for outer garments.

The school room is 24 feet 5 inches long by 19 feet 4 inches wide, and 15 feet 6 inches high in the clear, allowing an area of 472 feet, including the recess for the teacher's platform, and an allowance of 209 cubic feet of air to a school of 36.

The teacher's platform B is 5 feet 2 inches wide by 6 feet deep, including 3 feet of recess, and 9 inches high. On it stands a table, the legs of which set into the floor, so as to be firm, and at the same time movable, in case the platform is needed for declamation or other exercises of the scholars. Back of the teacher is a range of shelves *b*, already supplied with a library of near 400 volumes and a globe, outline maps, and other apparatus. On the top of the case is a clock. A black board 5 feet by 4 is suspended on weights and steadied by a groove on each end, so as to admit of being raised and lowered by the teacher, directly in front of the book case, and in full view of the whole school. At the bottom of the black board is a trough to receive the chalk and the sponge, or soft cloth.

The passages D D are two feet wide and extend round the room.

E E are 13 inches, and allow of easy access to the seats and desks on either hand.

F is 5 feet three inches, and in the center stands an open stove C, the pipe of which goes into one of the flues *b*. The temperature is regulated by a thermometer.

The aisles D D and F have a special reference to the doors.

Each pupil is provided with a desk G, and seat H, the front of the former constituting the back or support of the latter, which slopes 2 1-2 inches in 16. The seat also inclines a little from the edge. The seats vary in height, from 9 1-2 inches to 15, the youngest children occupying those nearest the platform. The desks are two feet long by 18 inches wide, with a shelf beneath for books, and a groove on the back side, *a* [Fig. 3,] to receive a slate, with which each desk is furnished by the district. The upper surface of the desk, except 3 inches of the most distant portion, slopes 1 inch in a foot, and the edge is in the same perpendicular line with the front of the seat. The level portion of the desk has a groove running along the line of the slope, *b* [Fig. 3,] so as to prevent pencils and pens from rolling off, and an opening, *c* [Fig. 3,] to receive an ink-stand. These are of metal, and shaped like the section of a cone, and are covered by a metallic lid, they can be removed when not in use in a tin case with a shelf perforated with holes to receive the given number of ink-cones, to the case back of the teacher.

The windows I, three on the north and three on the south side, contain each 40 panes of 8 by 10 glass, are hung (both upper and lower sash) with weights so as to admit of being raised or lowered conveniently. The sills are three feet from the floor. Those on the south side are to be provided with curtains or outside blinds. It would be better if the windows in a southern or western exposure were glazed with ground glass, which softens without obstructing the light.

The proper ventilation of the room is provided for by the lowering of the upper sash and by an opening 14 inches by 18, near the ceiling into the flue *a*, which leads into the open air. This opening can be enlarged, diminished, or entirely closed by a shutter controlled by a cord. There should have been an opening near the floor into both the flues *a a*, with an arrangement like the register of a furnace, so as to have reached the carbonic acid gas, which being heavier than atmospheric air, settles to the lowest place in the room. This however can be reached by opening the doors at the two extremes of the room, and allowing a current of pure air to sweep through like a broom, at the time of recess.

The sides of the room are ceiled all round with wood as high as the window sill, which, as well as the rest of the wood work of the interior, is painted to resemble oak.

Along the walls on one side of front door is suspended Mitchell's large Map of the United States, and on the other his Map of the world on Mercator's projection. Between the windows are maps of Connecticut, Massachusetts, Palestine and other portions of the earth mentioned in Scripture, and Catherwood's large colored plan of Jerusalem.

The following articles of apparatus have been or soon will be purchased for this school. Numerical frame or abacus—set of geometrical solids—set of blocks to illustrate cube root—diagrams of geometrical figures—globe—orrery—tellurium or season machine—tide dial—moveable blackboard and a slate for each scholar.

The library is, or will be soon, supplied with the following books *for the use of the teacher.*

Webster's Dictionary, Worcester's edition—Calmet's Dictionary of the Bible—Encyclopedia Americana 13 vols—Murray's Encyclopedia of Geography—Cyclopedia of History—Haywood's Gazetteer—Blake's Biographical Dictionary—Coe's Lessons in Drawing—Mayo's Lessons on Objects—Abbott's Teacher—Palmer's Prize Essay—Davis' Teacher Taught—Dunn's School master's Manual—Dwight's Teacher's Friend—Wines' "How shall I govern my school?"—Alcott's Confessions of a schoolmaster—Alcott's two days in a primary school—Alcott's account of the first district school, Hartford—Wood's account of the Sessional School, Edinburgh—Stow's Glasgow Training System—Cousin's Report on Education in Prussia—Cousin and Cuiver's Education in Holland—Prof. Stowe on Education in Europe—Journal and Annals of Education, 8 vols.—Massachusetts Common School Journal, vol. 1 and 2—Connecticut Common School Journal.

The following sets comprise the reading for the scholars and their parents.

THE SCHOOL LIBRARY, large and juvenile series as far as published, 26 vols. Published by Marsh, Capen, Lyon & Webb, 33 Washington st., Boston, and consist of books which have been prepared with special reference for school libraries, and approved by each member of the Massachusetts Board of education.

THE DISTRICT SCHOOL LIBRARY, 3 series, 145 vols., published by Harper & Brothers 96 Cliff st., New York. These works have been approved and recommended by the present and former Superintendent of common schools in New York, and by Governors Marcy and Seward.

THE SCHOOL LIBRARY, 121 vols., published by the Sunday School Union, Philadelphia. These works are intended mainly for juvenile reading, and have been long before the christian public.

THE CHRISTIAN LIBRARY, 45 vols., published by the American Tract Society, N. York. This set is intended to meet the wants of the young and the old for a higher order of moral and religious reading, than is embraced in works of history, biography, travels, &c., which are usually selected for school or public libraries.

The Christian Library was presented to the District, by Governor Ellsworth, as a testimony of his continued interest in the moral and intellectual improvement of his native district. This act will cause his name to be remembered with delight, by many of the old and the young, in present and future generations who may have access to the pleasures and consolations which these volumes are calculated to impart.

Besides the above sets there are thirty or forty miscellaneous volumes, and among them the works of Milton, Cowper, &c. presented by Erastus Smith, Esq., of Hartford.

The following regulations have been adopted by the district.

I. The District Committee for the time being shall be held responsible for the preservation of the Library, and shall cause to be made out one or more catalogues of the books, to be kept by the Librarian, and to be open to the inspection of the inhabitants of the District at all reasonable times.

II. The Teacher for the time being, or any other person residing in the district, may be entrusted with the charge of the Library, and held responsible for the preservation and delivery of the books, under such regulations as the District Committee may prescribe not inconsistent with the regulations of the District.

III. The Library shall be open for the delivery of books on Wednesday and Saturday of each week, unless otherwise directed, at such hour as the District Committee may designate.

IV. Any inhabitant of the District, who shall express a willingness to comply with the regulations which may from time to time be prescribed by the district, and has paid up all fines duly imposed, and any minor residing in the district, whose parents, guardian, or any other inhabitant, will become responsible for any fines which may be imposed for the damage or detention of books taken by such minor, shall be entitled to the privileges of the Library.

V. Every person entitled to the privileges of the Library may draw one book, and one only at a time, and retain the same for two weeks and no longer; but the same person may, after returning a book to the Librarian, take it again, unless application has been made for it by some one who had not previously borrowed the same, who shall in that case be entitled to its use.

VI. Any person who shall detain a book longer than fourteen days, shall forfeit and pay to the Librarian two cents for each day's detention, until the fine shall equal the value of the book, and at the expiration of such time, due notice shall be given by the Librarian to the borrower, to return such book within three days, and in case of its longer detention, the full value of the book, or of the set to which it belongs, shall be charged to the borrower, and on the payment of such fine, the book or set may be claimed and taken by the borrower.

VII. Any person, who shall injure, or deface any book belonging to the Library, shall forfeit and pay such sum as shall be assessed by the District Committee or the Librarian, with the liberty of appeal to the District Committee; provided the sum so assessed shall not exceed the full value of the book, or of the set, if it belongs to one; and all fines either for detention or damage of books shall be applied to the benefit of the Library.

VIII. No book shall be taken away from the Library, until the name or the number of the book, the name of the person taking it, and the day on which it is taken, are entered in a book to be provided for that purpose, and every person shall be held responsible for any book charged to him, until he sees the above entry erased, or crossed, on his returning the book to the Librarian.

IX. Such books as may have been or may hereafter be given to the Library with the understanding that they were to be accessible to teachers or other persons, residing without the district, will be to such extent excepted from the operation of the rules and regulations, and such books as the District Committee may specially direct to be retained in the Library, shall not be delivered to any person, without a written permission from the Committee.

X. The District Committee shall at the close of their official year, and at such other times as may be required, make a report to the district on the condition of the Library.

REMARKS MADE AT THE DEDICATION OF THE NEW SCHOOLHOUSE IN DISTRICT NO. 6.

It is good and proper for us to be here, and I am happy in being able to accept the invitation of your committee to be present and take part in such exercises as have been deemed appropriate to the opening of a new schoolhouse, so retired, attractive, and convenient as this.

There is an intrinsic propriety in the sacredness of the purpose, for which this edifice was erected, the physical, intellectual and moral culture of every child in this community, to call for its consecration in prayer, as has just been done in the presence of parents, teachers and children, to the cause of truth, justice, patriotism and religion. But important as this occasion is in itself, and to this district, not only in the present, but in the future generations of children, I cannot but feel that the completion of such a schoolhouse, combining so many advantages in respect to location, construction, and internal arrangement and furniture, will help to awaken a spirit of inquiry and improvement in this and other departments of our school system, far beyond your immediate limits; and thus restore it to its proper place in the regards of the patriot, the philanthropist and christian. In the discharge of official duties I have had occasion to visit and examine more than one thousand school houses, scattered through the eight counties, in more than two thirds of all the towns, and in every variety of district as to wealth, territory and population, and every where there is a pressing necessity for just such improvements as you have introduced here. The health, manners, morals and right education generally of the children, require it. To satisfy you of this, before passing to a consideration of what parents, teachers and children must do to make this a *model school*, I beg leave to dwell briefly on some of the principal features of this schoolhouse, compared with what you and every one who has turned any attention to the subject, know to exist too generally, not only in this vicinity, but all over the state.

1. *Location.* Thanks to the good sense and good taste of your committee, and to the public spirit of the original proprietor of the land, the house is located on a dry, elevated, and in every respect a healthy site. It is removed some sixty feet from the noise and dust of the highway, and from all sights and sounds of idleness and dissipation. While there is ample room in front for all to occupy in common for recreation and sports, there is in the rear of the building a separate yard for either sex. When spring returns it will deck the green sward properly enclosed, and nourish, I trust, some elms, oaks and maples, which will in a few years throw their sheltering shadows over house and play ground in summer, and break the inclemency of the storm in winter.

How striking and mournful the contrast presented in the location of most of our district schoolhouses. Go where you will, you find them *on* or rather *in* the public road, and not unfrequently in the public roads, where the attention of the scholars is disturbed by every passing object. I have visited them perched on the bleakest spot in the district, where all the winds and all the ways meet, on low marshy ground, or in the midst of minutely grained sand—spots which no prudent farmer would occupy with a barn or a pig pen, or a mechanic with his workshop, if they could be had free of expense. But bad as the location too often is, there is no provision made for play ground, shade trees or out door arrangements of any kind. It is the want of such arrangements which makes the schoolhouse an annoyance to the neighborhood where it is placed, and the common school objectionable to that class of parents who regard the health, manners and morals of their children as too precious to be exposed by the shameful neglect of the districts.

2. *Construction and Material.* This house is built according to rules of good taste, of durable materials, and in a workmanlike manner. The brick are not likely to be washed out by the rain, or the woodwork to shrink in the heat of the stove or sun, so as to leave knot holes, and cracks for the "crannying winds" to whistle through. It is protected from cold beneath by a solid foundation of stone and mortar, a well matched floor, and a ceiling of wood as high as the window sills. The woodwork in the interior is "oaked" so as to give a finish and respectability to its appearance which entitle it to the care and respect of the children, that I doubt not, it will receive.

But how is it in these respects with our schoolhouses generally? It would be difficult to classify the prevalent style of building with any of the received orders of architecture. Each building is a class of itself, or rather belongs to what Mr. Mann has happily called, the sixth order of architecture—the wicker-work order,—summer houses for winter residences. Many of them are so bunglingly constructed, the shingles and clapboards are so loose, the floor and ceiling so badly matched, the under pinning so open, that it would seem as if they had come together "by a fortuitous concourse" of materials. I must except here two venerable structures, which give unequivocal evidence of design in respect to protection from the cold beneath. They are forlorn specimens at best, of what has been called in prose and verse, the "moral beauties" of Connecticut. Their origin dates back beyond the memory of the oldest inhabitants. The storms of half a century, it would seem, have left their dingy stains on the shingles, and the roof of each is bent down under the weight of years. As the clapboards near the ground disappeared, either from decay, or other causes, the districts, although situated thirty miles apart, have resorted to the same expedient, to supply their place. They have banked up the schoolhouse with earth, until, with the exception of the windows, they are nearly two thirds under ground, and here the "district school" goes into winter quarters. The teacher of one of them said it had the rare merit of being cool in summer and warm in winter. I propose to have a sketch of one of them made and deposited with the Historical Society as a specimen of "the district schoolhouse in 1840."

I would not be understood to say that Connecticut deserves a bad pre-eminence in this respect. In a neighboring state, an eye witness makes the following statement in print. "I have good reason for remembering one of another class of schoolhouses, where on every cold day the teacher was obliged to compromise between the sufferings of those who were exposed to the cold of the windows, and those who were exposed to the heat of the fire, by not raising the thermometer of the latter above ninety degrees until that of the former fell below thirty. A part of the children suffered the arctic cold of Captains Ross and Parry, and a part the torrid heat of the Landers, without, in either case, winning the honors of a discoverer. It was an excellent place for the teacher to illustrate one of the facts in geography; for five steps would have carried him through the five zones. Just before my present circuit, I passed a schoolhouse, the roof of which on one side was trough-like; and down towards the eaves there was a large hole, so that the whole operated like a tunnel to catch all the rain, and pour it into the school room. At first I did not know but it might be some apparatus designed to explain the deluge. I called and enquired of the mistress if she and her little ones were not sometimes drowned* out. She said she should be, except that the floor leaked as badly as the roof, and drained off the water. And yet a healthful, comfortable schoolhouse can be erected as cheaply as one which, judging from its construction, you would say had been dedicated to the evil genius of deformity and suffering."

3. *Size.*—Most of the considerations which should determine the size and internal arrangements generally of a schoolhouse, have been properly regarded here, although it is to be regretted that the dimensions on the ground were not a little more liberal, so as to allow more space for the evolutions of the school, and a separate room for recitations and other useful purposes, back of the teacher's platform.

First.—There is a separate entry for boys and girls, by means of which much rudeness, confusion and impropriety of conduct will be avoided. A scraper and mat for the feet, hooks and shelves for outer garments, and a wash basin and towel for dirty hands and faces, (if such things should ever be found among pupils so neat and cleanly, as those before me,) have been or will be provided, and thus the health, manners, as well as proper habits of neatness and order be secured.

Second.—The school room is spacious, cheerful and healthy. The unusual height of the ceiling and dimensions of the windows, the maps suspended around the walls, and the appropriate color of the wood work, must strike every eye favorably, compared with the dingy, prison-like aspect of most of our district schoolhouses. The area of the floor, including the recess for the teacher's platform and library, is about 474 feet, and allows 16 feet for thirty scholars, or 14 feet for thirty-six scholars. The additional height of six or seven feet, given to this room, over the low ceilings so universal elsewhere, while it adds but a trifle to the expense, gives a symmetry to the proportions of the building, and almost doubles the quantity of air which would otherwise be allowed to each individual. That is, it gives 250 cubic feet of air to each pupil in a school of thirty, and 209 feet to each in a school of 36, instead of an allowance of 40 to 60 cubic feet under the same circumstances. As will be seen by what I shall soon say of the philosophy of ventilation, this is a prime consideration.

Third.—Space and appropriate accommodation for teacher and scholar are here secured. From this raised platform the teacher can survey the whole school at a glance, and conduct the reading and recitations of his classes arranged, either immediately around him, or which is far more preferable, along the opposite end of the room. In the last position, those who read or recite must of necessity speak loud and distinct in order to be heard, while the attention of the rest of the school, will be less likely to be disturbed, as the ear only will be attracted by what is going on. Directly back of the teacher are cases, for books and apparatus, already to some extent provided, and that indispensable article, a large blackboard, is so arranged with weights, as to be of convenient access, always within sight of the reciting class, and of the whole school, and yet, in the way of no one.

Each scholar, young and old, is provided with a seat and desk, of appropriate height, and easy access. Of them and the mode of their arrangement, I will speak presently.

Besides the space occupied by the platform of the teacher and the seats and desks of the scholars, there are aisles, conveniently arranged in reference to the doors and the evolutions of the school. The space, especially in the centre and around the sides of the room, can, on occasions like this, or of the visitation or examination of the school, be occupied by chairs, or benches, for the accommodation of parents and friends who may be disposed to come in.

The size of school rooms, in reference not merely to the proper seating and necessary evolutions of the scholars, but to the cheerfulness, comfort and health of the inmates, has been strangely overlooked with us. Districts and committees have acted apparently on the principle of packing away as much live matter as possible in a given space. They have thereby saved money in an outlay which is not to be repeated oftener than once in a generation, only to entail upon parents and guardians from year to year a much larger expenditure for ill health, engendered in low, contracted, unventilated school rooms. This subject however is now better understood, and a wiser practice is slowly gaining ground. The building committee of this district have only applied the principle laid down by the best authorities on the subject, and introduced, not only into structures of this character, but into every hospital and prison, which has been recently erected. Mr. Lancaster, who consulted the most rigid economy in his plans of schoolhouses for the children of the poor, allowed an area of nine feet, and 150 to 180 cubic space to each pupil. Dr. Alcott, in his Prize Essay on schoolhouses, recommends a space not less than four feet square to each, which with the ordinary height of school rooms would make the same allowance of air. Mr. Woodbridge, to whom the cause of education owes so much, supposes that 150 cubic feet of space is the smallest which should be allowed to each individual. Mr. Mann, in his report on schoolhouses, the latest and best exposition of the whole subject, without fixing on a minimum of space, handles with great severity that miserable economy, or oversight, which would stint children in the use of pure air, which is poured forty and fifty miles deep all round the globe.

The best European writers on hospitals, deem it indispensable that every patient should have a space, never less than 600 cubic feet, and the best institutions of this kind have nearly twice that allowance. In the Lunatic Asylum at Worcester, space equal to 800 cubic feet is allowed to each patient. Besides this liberal allowance of room, each apart-

*The catastophe apprehended from a leaky roof, threatens to overtake the children in one of the district schools of the first school society in Hartford. To an enquiry whether there was any opening in its ceiling for the impure air which had once been breathed to escape, the teacher of the school referred to, remarked, "that if such air could get out where water could get in, there were openings enough." Those who would see a specimen of the district schoolhouse as it is, would do well to extend their walks to the schoolhouse referred to.—Eds.

ment is furnished with the most perfect system of ventilation, by the introduction of pure warm air, heated by a furnace, and the escape of the air which has once been breathed by means of openings into flues which conduct it into an attic, and hence into the open air.

In the Penitentiary of Philadelphia, 1300 cubic feet of air are allowed to every prisoner in solitary confinement. In the State Prisons at Sing Sing, Auburn, Concord, and Wethersfield, each cell contains a space equal to 171 cubic feet besides being ventilated by an opening in most instances, at the top and bottom into a flue which leads out into the open air. In the new county prisons at Hartford and Norwich, each cell has a space of 350 cubic feet, and in addition to an opening of four inches square at the top and bottom of each cell, the whole body of cells is surrounded by a spacious area, well lighted and ventilated. I have no hesitation in saying that there is not a district schoolhouse in the state, not even excepting the new one of which I am speaking, so well ventilated, as either of these County Prisons. No one thinks now-a-days of stinting criminals in the allowance of pure air. No one thinks of compelling them to work in such an atmosphere as nineteen twentieths of all the children and teachers of the state are required to study in. Nature however takes her revenge, and the children do not study, and cannot study to any useful purpose long before muscle, nerve and mind faints and expires under its deleterious influences.

In 40 out of 200 schoolhouses of which I have obtained accurate measurements, taken indiscriminately from the whole number, the average space allowed to each scholar is less than 70 cubic feet.

4. *Light.*—By the arrangements in respect to windows here adopted,—large, elevated from the floor, and only on two sides of the building, the north and south,—several desirable objects are attained. An abundance of steady light, in clear weather, is secured from the north, the best possible for a school room, as well as the cheerfulness and warmth of a southern exposure. Any excess of light from the south can be modified or excluded, by blinds or curtains to be provided, or what would be better, softened by passing through ground glass.—The danger to the eye sight, and the inconvenience, resulting from windows behind the teacher or the pupils, is here avoided. The attention of a single scholar when in his seat, need not be diverted by any passing object in the street. This last object is secured, by the elevation, and distance of the building from the street, by the arrangement of the seats so as to turn the faces of the scholars in the opposite direction, and by inserting the windows three feet and a half from the floor.

5. *Ventilation.*—The means of ventilating this school room, and thus renewing the vital portions of the atmosphere which are constantly absorbed, and removing impurities which at the same time are generated by the breathing of teacher and pupils, and by the fire in the stove, are much better than in most structures of this kind. The size of the room more than trebles the usual allowance of pure air to begin with, and which would therefore be kept purer than in most school rooms by the imperfect and irregular supply of fresh air admitted at cracks, crevices, and open doors. The opening near the ceiling into one of the flues, allows of the escape of the impure, overheated air which rises to the top of the room. The open stove with the large pipe, will create a draft all around it to sustain the fire, in which the deadlier and colder impurities near the floor will be carried off. The windows and doors on opposite sides and ends of the room, will further enable a judicious teacher at the recess, and the dismissal of the school at noon or night, to complete the thorough renewal of the atmosphere of the room, in which its proper ventilation consists.

The importance of some such arrangements, more perfect even than these, to effect a constant supply of pure air, not only in school rooms, but in any room where living beings congregate in numbers for business or pleasure, and where fires or lights are kept burning, seems to me to be strangely overlooked, to the inevitable sacrifice of health, comfort, and all cheerful and successful labor. We practically defeat the beautiful arrangements of our Creator by which the purity of the air would otherwise be preserved by its own constant renewal, and the harmonious growth and support of the animal and vegetable world maintained. We voluntarily stint ourselves in the quantity and quality of an article, which is more necessary to our growth, health and comfort, than food or drink, and which our beneficent Father, has furnished pure, without money and without price to our very lips, and so abundantly that we are, or should be if we did not prevent it, literally immersed in it all our lives long. Let me bespeak your particular attention to a familiar exposition of some of the scientific and practical principles connected with this subject, and which have been to some extent regarded in the arrangement of this room.

The atmosphere which surrounds our earth to the height of forty-five miles, and in which we live, and move, and have our being, is composed mainly of two ingredients, oxygen and nitrogen, with a slight admixture of carbonic acid. The first is called the vital principle, the breath of life, because by forming and purifying the blood it alone sustains life, and supports combustion. The fact that we breathe, and that the fire burns, is proof that there is oxygen in the atmosphere of this room, and that we breathe freely, and the fire burns brightly, that it is here now in its due proportion. But to sustain these processes there is a constant consumption of this ingredient going on, and as you will see by the facts in the case, the formation and accumulation of another ingredient, carbonic acid, which is deadly hostile to animal life and combustion. This gas is sometimes found in wells, and will there extinguish a lighted candle if lowered into it, (and which should always be lowered into a well before any person ventures down) and is not an uncommon cause of death in such places. It is almost always present in deep mines and at the bottom of caverns. Near Naples there is one of this description, called the Grotto del Carne, or the Grotto of the Dog, because the guides who accompany strangers to the interesting spots in the vicinity of Naples, usually take a dog along with them to show the effects of this gas upon animal life. Being heavier than common air it flows along the bottom of the cavern, and although it does not reach as high as the mouth or nostrils of grown men, no sooner does a dog venture into it, than the animal is seized with convulsions, gasps and would die if not dragged out of it into the pure air. When recovered, the dog shows no more disposition to return to the cavern, though called after his own name, than some children do to go to places called schoolhouses, where experiments almost as cruel are daily and hourly tried. I have seen such houses, where a dog would show very bad taste and very little regard for his own safety, if he manifested any disposition to stay in them any longer than was absolutely necessary, and did not scamper away with the same delight that school children do when disimprisoned. If any of you should ever go to Naples, you will probably think as I did, that there is no occasion to go two or three miles out of your way to see the effects of carbonic acid upon a poor dog, when you can see it tried any day of a long winter on thirty or forty children at a time in almost any one of the district schools of Connecticut, especially if you have been the subjects of such experiments for ten or twelve years yourself. But this gas, bad as it is in reference to animal life and fires, is the essential agent by which our earth is clothed with the beauty of vegetation, foliage and flowers, and in their growth and development, helps to create or rather manufacture the oxygen which every breathing creature and burning fire must consume. The problem to be solved is how shall we least mar the beautiful arrangements of Providence, and appropriate to our own use as little as possible of that, which though death to us, is the breath, and the life blood of vegetation.

The air which we breathe, if pure, when taken into the mouth and nostrils, is composed in every one hundred parts, of 21 oxygen, 78 nitrogen, and 1 of carbonic acid. After traversing the innumerable cells into which the lungs are divided and sub-divided, and there coming into close contact with the blood, these proportions are essentially changed, and when breathed out, the same quantity of air contains 8 per cent. less of oxygen, and 8 per cent. more of carbonic acid. If in this condition (without being renewed,) it is breathed again, it is deprived of another quantity of oxygen, and loaded with the same amount of carbonic acid. Each successive act of breathing reduces in this way, and in this proportion, the vital principle of the air, and increases in the same proportion that which destroys life. But in the mean time what has been going on in the lungs with regard to the blood? This fluid, after traversing the whole frame, from the heart to the extremi-

ties, parting all along with its heat and ministering its nourishing particles to the growth and preservation of the body, returns to the heart changed in color, deprived somewhat of its vitality, and loaded with impurities. In this condition, for the purpose of renewing its color, its vitality and its purity, it makes the circuit of the lungs, where by means of innumerable little vessels, inclosing like a delicate net work each individual air cell, every one of its finest particles comes into close contact with the air which has been breathed. If this air has its due proportion of oxygen, the color of the blood changes from a dark purple to a bright scarlet; its vital warmth is restored, and its impurities, by the union of the oxygen of the air with the carbon of blood, of which these impurities are made up, are thrown off in the form of carbonic acid. Thus vitalized and purified, it enters the heart to be sent out again through the system on its errand of life and beneficence, to build up and repair the solid frame work of the body, give tone and vigor to its muscles and re-string all its nerves to vibrate in unison with the glorious sights and thrilling sounds of nature, and the still sad music of humanity.

But in case the air with which the blood comes in contact, through the thin membranes that constitute the cells of the lungs, does not contain its due proportion of oxygen, viz. 20 or 21 per cent, as when it has once been breathed, then the blood returns to the heart unendued with newness of life, and loaded with carbon and other impurities which unfit it for the purposes of nourishment, the repair, and maintenance of the vigorous action of all the parts, and especially of the brain, and spinal column, the great fountains of nervous power. If this process is long continued, even though the air be but slightly deteriorated, the effects will be evident in the languid and feeble action of the muscles, the sunken eye, the squalid hue of the skin, the unnatural irritability of the nervous system, a dis-inclination to all mental and bodily exertion, and a tendency to stupor, headache and fainting. If the air is very impure, i. e. has but little or no oxygen and much carbonic acid, then the imperfect and poisoned blood will act with a peculiar and malignant energy on the whole system, and especially on the brain, and convulsions, apoplexy and death must ensue.

Abundant instances of the beneficent effects of pure air, and the injurious and fatal results of breathing that which is impure, might be cited from the history of hospitals and prisons, and writers generally on health and education. In the Dublin Hospital, between the years 1781 and 1785, out of 7650 children, 2944 died within a fortnight of their birth—that is more than *one in three*. Dr. Clark, the physician, suspecting the cause to be an imperfect supply of pure air, caused it to be introduced by means of pipes into all of the apartments, and in consequence, during the three following years, only 165 out of 4242 died within the two first weeks of their birth—that is less than *one in twenty*. Dr. Buchan, at a little earlier date, by the same arrangement reduced the mortality of children in a hospital in Yorkshire, from *fifty in one hundred*, to *one in fifty*. In these two cases there was an immense saving of human life. But the good done by these intelligent and observing physicians was not confined to these hospitals for a few years. The results of their observation and labors led to the introduction of more perfect arrangements for a supply of pure air in all structures of a similar character in England and elsewhere. And at this hour there are hospitals in this country and in England, in which there is a larger number of cubic feet of air, and that kept pure by perfect means of ventilation, allowed to *each patient* than is contained in many school rooms in this state occupied by 20, 30, or 40 children, heated with a close stove, and provided with no means of ventilation except such as time and decay have made.

The diminished mortality of prisons, and the almost entire disappearance of that terrible scourge, the jail fever, so frequent before the days of Howard, is to be attributed mainly to the larger allowance and regular supply of pure air secured by improved principles of prison architecture and discipline. There are instances on record, where the inmates of prisons have escaped the visitation of some prevalent sickness, solely on the ground of their cells being better provided with pure air, than the dwelling houses all around them. The prisoners in the Tolbooth, in Edinburgh, were unaffected by the plague, which caused such dreadful mortality in that city, in 1645, and this exemption was attributed to their better supply of pure air. Humbolt in his Personal Narrative, mentions the case of a seaman who was at the point of death, and was obliged to be removed from his hammock, which brought his face to within a foot of the deck, into the open air, in order to have the sacrament administered as is the custom on board of Spanish vessels. In this place he was expected to die, but the change from the stagnant, impure atmosphere in which his hammock was hung, to the fresh, purer atmosphere of the deck, enabled the powers of life to rally, and from that moment he began to recover. Even the miserable remnant of the party who were confined in the Black Hole of Calcutta, sick as they were of a malignant, putrid fever, recovered on being admitted to the fresh air of heaven, under proper medical treatment. But the history of this whole affair is a terrible lesson on this subject, which though often repeated, cannot be too often dwelt upon. Most of the children here, I dare say, have heard of the Black Hole of Calcutta. We meet with it in the newspaper and in daily conversation as a comparison, a proverb of terrible significance. This Black Hole is a prison in Calcutta, 18 feet square, into which the Nabob of Bengal after the capture of Fort William from the British in 1756, thrust 146 English prisoners. The only opening to the air, except the door was by two windows on the same side, strongly barred with iron. Immediately on the closing of the door a profuse perspiration burst out on every prisoner. In less than an hour their thirst became intolerable, and their breathing difficult. The cry was universal and incessant for air and water, but the former could only come in from the grated windows, and the latter, when supplied by the guards without, only aggravated their distress. All struggled to get near the windows, and in this death struggle as it were, many were trampled under foot. In less than three hours several had died, and nearly all the rest were delirious and prayed for death in any form. On the opening of the door at six o'clock in the morning, less than eleven hours after it was closed, death had indeed come to the relief of 123 out of the 146, and the remainder had sunk down on their dead bodies sick with a putrid fever. Now what did all this anguish, and murderous results spring from? From breathing over and over again air which had become vitiated and poisonous by passing repeatedly through the lungs, and by exhalations from the surface of the bodies of the persons confined there. "This terrible example," says Dr. Combe in his Principles of Physiology, "ought not to be lost upon us, and if results so appalling arise from the extreme corruption of the air, results, less obvious and sudden, but no less certain, may be expected from every lesser degree of impurity."

"In our school rooms," says Dr. Bell, "churches, hospitals and places of public evening amusements, and even in our private dormitories, we not unfrequently make near approaches to the summary poisoning process of the Black Hole at Calcutta." We do not appreciate the magnitude of the evils produced by breathing frequently, even for a short period at any one time, a vitiated atmosphere, because the ultimate results are both remote, and the accumulation of repeated exposures. Besides, the immediate effects may be not only slight, but may apparently disappear on our breathing again a free and purer air, so that we forget to appreciate the temporary inconvenience or suffering and to refer them to their true cause. How often do we retire at night, perfectly well, and rise up in the morning unrefreshed with sleep, with an aching head, a feverish skin, and a sick stomach, without reflecting that these symptoms of a diseased system are the necessary effects of breathing the atmosphere of a chamber, narrow in its dimensions, closed against any fresh supply from without, and not unlikely made still more close by a curtained bed, and exhausted of even its small quantity of oxygen, by a burning fire or lamp? These same causes, a little longer in operation, or a little more active, would produce death as surely, although not as suddenly as a pan of ignited charcoal in the room. Who has not noticed that the fainting and sickness which so often visits persons, and especially females of delicate health in crowded churches and lecture rooms, only occurs after the air has become overheated and vitiated, by having been a long time breathed, and that an exposure to the open air generally restores the irregular or suspended circulation of the blood? In the relief and newness of life which we experience on emerging from such places of crowded resort, we forget that the

weariness and languor, both of mind and body which we suffered within, were mainly the depressing effects of the imperfectly vitalized blood, and that the relief is simply the renovated life and vigor, which the same blood, purified of its carbon by coming in contact with the oxygen of the air imparts to the whole system, and especially to the brain. But in spite of our forgetfulness of the cause, or the apparent disappearance of the temporary inconvenience and distress, which should warn us to beware of a repetition of the same offence against the laws of comfort and health, repeated exposures are sure to induce or develop any tendency to disease, especially of a pulmonary or nervous character in our constitutions, and to undermine slowly the firmest health. Who can look round on a workshop of fifteen or twenty females, breathing the same unrenewed atmosphere, and sitting perhaps in a position which constrains the free play of the lungs, and not feel that disease, and in all probability, disease in the form of that fell destroyer of our fair countrywomen, consumption, will select from among those industrious girls, its ill starred victims? The languor, debility, loss of appetite, difficulty of breathing, coughs, distortion of the frame, (fallen away from the roundness natural to youth and health,) nervous irritability, and chronic affections of various kinds, so common among females in factories, even in our own healthy New England, or those who have retired from such factories to their own homes to die, or wear out a dying life all their days, are the natural fruits of an exposure, day after day, to an atmosphere constantly becoming more impure from the vitiated breath of forty or fifty persons, and rendered still more unfit for respiration by dust and minute particles floating in it calculated to irritate the already inflamed and sensitive membrane which encloses the air cells of the lungs. To this exposure in the workroom should be added the want of cheerful exercise, and innocent recreation in the open air, and the custom of herding together at night in the small, unventilated sleeping apartments of our factory boarding houses.

I should be glad to pursue this subject into its thousand diversified forms of mischief, all more or less extensive, and always insidious, but must return briefly to its connexion with the school room. Here the same poisoning process goes on day after day, and if the work is less summary, it is in the end more extensively fatal, than in the Black Hole of Calcutta. True, we have no school rooms, quite so small, compared with the number they are made to hold, as that prison house, but I can point to many where the allowance of air to each person, is not twice as great. And in more than seven eighths of all the school houses, the children are allowed a less quantity of pure air than the inmates of the State Prison at Wethersfield, or the County Jail, at Norwich and Hartford. I know of but one school room, which can be said to be too large, and that is in the basement room of a church, and is dark, damp, and imperfectly ventilated. Every man and woman, who received any portion of their early education in the common schools, can testify to the narrow dimensions, and low ceiling of the school rooms, and to the discomfort arising not only from hard seats, and from frequent and extreme alternations of heat and cold, but from the close, stagnant, offensive atmosphere, which they are obliged to breathe. Who does not remember the comparative freshness and vigor of mind and body with which the morning's study and recitations were begun, and the languor and weariness of body, the confusion of mind, the dry skin, the flushed cheek, the aching head, the sickening sensations, the unnatural demand for drink, the thousand and one excuses to get out of doors, which came along in succession as the day advanced, and especially in a winter's afternoon, when the overheated and unrenewed atmosphere had become obvious to every sense? These were nature's signals of distress, and who can forget the delicious sensations with which her holy breath, when admitted on the occasional opening of the door, would visit the brow and face, and be felt all along the re-vitalized blood, or the newness of life with which nerve, muscle and mind were endued by free exercise in the open air at the recess, and the close of the school? Let any one who is skeptical on this point visit any one of the 1700 or 1800 district schools in this State—the school of his own district, where his own children perhaps are condemned to a shorter allowance of pure air than the criminals of the State, and he cannot fail to see in the pale and wearied countenances of the pupils, the languor and uneasiness manifested, especially by the younger children, and exhaustion and irritability of the teacher, a demonstration that the atmosphere of the room is no longer such as the comfort, health and cheerful labor of both teacher and pupils require. In this way the seeds of disease are sown broadcast among the young, and especially among teachers of delicate health. "In looking back," says the venerable Dr. Woodbridge in a communication on school houses to the American Institute of Instruction, "upon the languor of fifty years of labor as a teacher, reiterated with many a weary day, I attribute a great proportion of it to *mephetic air;* nor can I doubt that it has compelled many worthy and promising teachers to quit the employment. Neither can I doubt, that it has been the *great cause* of their subsequently sickly habits and untimely decease." A physician in Massachusetts, selected two schools, of nearly the same number of children, belonging to families of the same condition of life, and no causes, independent of the circumstances of their several school houses, were known to affect their health. One house was dry and properly ventilated—the other damp, and not ventilated. In the former, during a period of forty five days, five scholars were absent from sickness to the amount in the whole of twenty days. In the latter, during the same period of time and from the same cause, nineteen children were absent to an amount in all of one hundred and forty-five days, and the appearance of the children not thus detained by sickness indicated a marked difference in their condition as to health.

My own observation and inquiries in the school room has satisfied me, that much of the illness complained of by children, especially in the winter season, is caused or aggravated by the impure air, combined with the extreme and frequent alternation of temperature in different parts of the room, and at different periods of the day.

The necessity of renewing the atmosphere, does not arise solely from the consumption of the oxygen, and the constant generation of carbonic acid, but from the presence of other destructive agents, and impurities. There is a carburetted hydrogen, which Dr. Dunglison in his Physiology, characterizes, "as very depressing to the vital functions. Even when largely diluted with atmospheric air, it occasions vertigo, sickness, diminution of the force and velocity of the pulse, reduction of muscular vigor and every symptom of diminished power." There is also sulphuretted hydrogen, which the same author says in its pure state kills instantly, and in its diluted state, produces powerful sedative effects on the pulse, muscles and whole nervous system. There are also offensive and destructive impurities arising from the decomposition of animal and vegetable matter in contact with the stove, or dissolved in the evaporating dish. But I have dwelt long enough on the agents which render it absolutely necessary to the health, comfort and cheerful labor of teacher and pupils, that the atmosphere of a school room should be constantly renewed, or ventilated.

The objects to be attained are—the removal of such impurities, as I have referred to, and which are constantly generated, wherever there is animal life and burning fires, and the due supply of that vital principle, which is constantly consumed by breathing and combustion. The first can be in no other way effectually secured, but by making provision for its escape into the open air, both at the top and the bottom of the room. By an opening *in or near the ceiling*, into a flue leading into the open air, the warmer impurities, (and air when warm, and especially when over heated will retain those noxious gases longer) which rise, will pass off. By an opening *near the floor* into the smoke flue, or even into a flue constructed for the purpose, the colder and deadlier impurities will be drawn in to supply the partial vacuum occasioned by the ascending column of smoke and heated air above. Thus the common fireplace and chimney is an excellent ventilator, for there is a strong current of air near the floor towards the fire to support the combustion, and in this current the carbonic acid, which as soon as it becomes a little cold, settles to the floor, is drawn along into the fire and up the chimney. There is however such an enormous want of heat in these fire places and even when multiplied, they afford so variable a temperature, and cause such an influx of cold air through every crevice to supply the current always ascending the chimney, that I cannot recommend their restoration to the school room, from which they are now universally banished. But the chimney

which receives the stove pipe should extend to the floor, and open there into the room with some arrangement like the register of a furnace, and thus all the purposes of the old fashioned fireplace, in reference to ventilation, can be secured. I hope this will be done with the flue on the north side into which the stove pipe is carried. To supply the oxygen, which is withdrawn by combustion and respiration, and also the air which will escape into the chimney, and through the openings above described, pure warm air should be constantly flowing into the room. For this purpose some of the modes for warming the air before it becomes impure by breathing, and before it enters the room, which I shall soon describe, should be adopted. The common mode of opening a window, or door, is imperfect and objectionable, inasmuch as the cold air falls directly on the head, neck and other exposed and sensitive parts of the body, and thus causes discomfort, catarrh, and other more serious evils, besides reducing the temperature of the room too suddenly and too low. This mode of ventilating a room should not be resorted to except with great precaution and generally only at recess, or intermission; if there is however no other mode of ventilation, the upper sash should be occasionally lowered but not more than one or two inches, and on different sides of the room.

The ventilation of large factory work rooms in England is now effectually secured by a simple contrivance, called the excentric fan, placed at one end of an apartment, and made to revolve with great rapidity by being attached to the steam engine. The impure air of the room is drawn into the fan to supply that which is condensed by the revolving wings, and forced out through a pipe leading into the open air. When the fan is propelled, so as to revolve with the rapidity of 80 ft. per minute, it throws the air so powerfully out, in an apartment about 200 feet long, as to create a draft at the other end capable of keeping a weighted door six inches ajar. Dr. Ure in his "Philosophy of Manufactures" mentions a curious instance of the consequence of introducing one of these ventilating fans into a weaving mill near Manchester. The work people instead of thanking their employer for his humane attention to their comfort and health, made a formal complaint to him, that the ventilation had increased their appetites and therefore entitled them to corresponding increase of wages! As their pay was nearly double of that received by laborers on the breezy plains of Sussex and Kent, the profits of the establishment would not admit of any augmentation. But the employer made a compromise; by stopping the fan during half the day, he adjusted the ventilation and voracity of his establishment to a medium standard, after which he heard no complaint on the score of health or appetite.

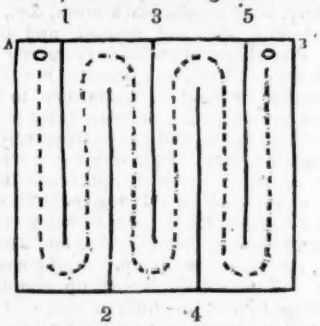
The most effectual mode of ventilating or removing the air of any large room, is necessarily connected with the modes of warming, and upon them I will touch lightly in speaking of the *temperature* of school rooms.

There is a mischievous error prevailing, that if a room is kept at a low tempera ure there is no need of ventilation. Dr. Alcott mentions the case of a teacher, who when asked if she did not find it difficult to keep her room ventilated, replied, "not at all, it is one of the coolest rooms in the city." I have received the same reply in substance again and again. The necessity of ventilation arises from the consumption of the oxygen and the generation and accumulation of carbonic acid principally in breathing, and both of these processes can go on and do go on, in a cold room, as well as a warm one if human beings are collected in it and goes on rapidly and fatally according to the number of persons and the size and closeness of the apartment. Dr. Arnott in his work on "warming and ventilating," mentions a striking instance of popular ignorance with respect to this subject, and of a mischievous practice founded upon that ignorance among some poor girls in Buckingham shire, England, who gained their livelihood by lace making. To save the expense of fire they were wont in winter to choose among the rooms belonging to their families the smallest which would contain to the number of twenty or thirty of them, and then to congregate and keep themselves warm at their work by breathing. The atmosphere of the room, as might have been expected by any one acquainted with its constitution and the process going on, although unperceived by themselves, soon became exceedingly offensive to a stranger entering, as well as highly injurious to them. The pale faces, broken health and early deaths of many of these ignorant se lf destroyers were the identical results a little more remote, which are caused by the atmosphere of our school rooms, churches, manufactories and other places where men, women or children are crowded together. These results are quickened in overheated atmosphere, because such air has less oxygen, and retains the impure gases longer. Still the scenes of death and misery in the Black Hole of Calcutta would have taken place if the same prison house had been in Greenland.

6. *Temperature.*—The means of producing, diffusing and duly regulating artificial heat in a school room, is, in a climate like ours, another of the indispensable conditions of health, comfort and successful labor. To effect this, the structure must not be "a summer house for winter residence" but be calculated to keep out the cold wind and especially to prevent its entering at cracks, and defects in the doors, windows, floors, and plastering, so as to fall suddenly and directly only on the feet, neck, or other sensitive and exposed portions of the body. Fuel of the right kind, in the right condition, in suitable quantity and in due season must be provided. The best modes of consuming it so as to extract its heat and diffuse it equally through all paris of the room and retain it as long as is safe, must be resorted to. The means of regulating it, so as to keep up a uniform temperature in different parts of the room, and to graduate it to the varying circumstances of a school at different periods of the day, and in different states of the weather, must not be overlooked. These objects and principles are regarded to some extent here. From its position, its materials, its workmanlike construction, and the trees which will ere long temper the heat of summer and break the force of the winter's wind, this house is calculated not only to be cool in summer, but warm in winter. There are no ill matched floors to subject the children to cold feet, and thus disturb the circulation of the blood and prevent its regular re-vitalization in the lungs, which operates like a slow poison on the system. There are no cracks, no broken panes of glass, no loose windows, no shackling doors to admit the cold wind on portions, and usually the most exposed portions of the body, and thus cause a variety of painful sensations, headaches, stiff necks, rheumatism, catarrh and the germs of even more serious diseases. When your wood shed is completed, and which I hope will be large enough to be a shelter and place for recreation during the recess and intermission in wet weather, you will, I doubt not, see that there is a suitable supply of hickory, hard maple, black birch, &c., early in the season, properly cut, split and housed, and not do as is sometimes done elsewhere allow each proprietor to bring his proportion when he pleases, and perhaps not till the school has been suspended for want of it, and then to leave it all about the premises, not cut, split, or housed, but to be incased in ice, or covered up in snow, and not unfrequently so green, and of such poor quality that "lightning itself will scarcely ignite it." Little do parents seem to appreciate the necessary consequences of their shameful neglect in this one particular—the loss of a considerable portion of the morning session, the aching feet and hands, the benumbed faculties, the interrupted recitations, the harmony, temper, and pleasant associations with study and the school broken up, and all from the want of proper regard for their children and of that prudence and forecast which makes their own winter firesides cheerful and happy. The open stove with large pipe, not bending till the horizontal position is carried ten or twelve feet above the heads of the children, affords as effectual, economical and unobjectionable a mode of consuming the fuel and disseminating the heat as any stove of this kind. It is far superior in point of economy to the open fire place, as ordinarily constructed in which near seven-eights of the heat evolved, ascend the chimney and only one eighth, or according to Rumford and Franklin, only one fifteenth is radiated from the front of the fire into the room. It has to some extent the cheerful light of the open fire, to which habit and association have attached us, and the advantages of the latter, in opening broadly near the floor, and thus drawing in the colder air with the carbonic acid in the current which goes to sustain the combustion and ascend the large pipe of the stove. Unless the common mode of constructing fireplaces and chimneys can he greatly improved, or the original *Franklin fireplace* or *stove*, or the *double fireplace* be substituted, the waste of heat, and the pressure of cold air through every crevice to supply the ascending current

and the rapid combustion, I can see no advantages in the open fireplace which cannot be secured in the large open stove. The original *Franklin stove*, or *fireplace* was constructed of cast iron, and by means of a circuitous chimney or smoke flue, which was surrounded and intersected by air passages, opening at one end out of doors, and at the other into the room, the heat of the fire was retained, and a current of fresh warm air was constantly flowing into the room. This is quite a different thing from the ordinary open fireplace. The *double fireplace* is a modification of Franklin's plan.* It is made from any common fireplace by inserting within it another fireplace made of soap stone, leaving an empty space of about an inch in depth, between the two, so that when finished the back and sides may be hollow. This hollow space, communicates at one end with the open air by a pipe, and the other opens into the room, on the side of the chimney. In this fireplace the advantages of an open fire of wood or coal can be enjoyed at the same time a current of air is warmed in the rear of the fire.

Various plans have been proposed and adopted elsewhere to make the common stove, whether close or open, serviceable in warming pure air before it is thrown into the room. Mr. Woodbridge in his essay on school houses in the transactions of the American Institute of Instruction for 1831, describes one as follows:—the stove is enclosed on three sides in a case of sheet iron, leaving a space of two or three inches beneath and around the stove, and as it rises around it becomes warmed before it enters the room at the top of the case. The case is moveable so as to allow of the cleaning out of any dust which might collect between it and the stove. The quantity of air admitted can be regulated by the heat of the stove and of the room. Mr. Palmer in his Manual for Teachers, which received a prize of $500 offered by the American Institute of Instruction in 1839, secures the same object by conducting the air from without, into a passage which traverses the bottom of the stove five or six times before it enters the room, and thus becomes warm. It is thus described—Let there be a double bottom to the stove, the lower fitting closely to the upper by the four edges, and by the flanges, marked 1, 2, 3, 4, 5. Let there be two openings in the back part of the plate; the one at A, communicating with the outward air, by a pipe, which passes through the floor, and thence through the south wall; the one at B, communicating with the schoolroom.



From the above figure, it will be perceived, that the outward air entering in at A, will pass six times, lengthwise, across the hearth of the stove, before it passes into the room at B. It will thus be sufficiently warmed, and yet, being protected, by the ashes, from the great heat to which the sides of the stove are exposed, it will not be burned, i. e. deprived of its oxygen, and thus rendered unfit for respiration, as air heated in furnaces commonly is, in a greater or less degree. By coming out at the back part, it will not be liable to be drawn in at the door of the stove. There will thus be a continual interchange of fresh, warm air, for the fouler air passing into the stove to supply the draft. The heat of this air should not be greater than is pleasant to the hand, being regulated, reciprocally, by the quantity of ashes in the stove, and directly, by the intensity of the fire. Such a stove-plate as has been described, might be procured at any foundry. Where it cannot be had, its place might be supplied, in some degree, by removing the legs of the stove, and placing it on a small chamber of brick, furnished with openings and tube, as described above. But this, although better than receiving cold air through every crack and crevice, as at present, would be vastly inferior to the double bottomed stove. A room, supplied with either of these contrivances, however, would be so full of air, as to cause it to *press outwards*, besides furnishing a supply for the draft of the stove, instead of having cold air continually *pressing in*."

The same thing can be secured by a similar arrangement connected with stoves for burning anthracite coal. In the Olmsted stove, for instance, the pure air from without can be made to pass in contact with the exterior, as well as the interior surface of the radiators and thus be warmed before entering the room. The last stove has an advantage, in admitting of the slow combustion of billets of wood in connection with nut or pea coal, and thus maintaining a fire which will keep up a uniform temperature of the proper degree at the cheapest rate. In Dr. Arnott's thermometer stove there is a contrivance for keeping up a uniform temperature by an apparatus which regulates its own combustion, increasing or diminishing the draft so that the quantity of air admitted to the fire shall be such as to sustain always the degree of temperature required. Whenever anthracite coal can be had, the Olmsted stove, adapted to schools, seems to me as well calculated to answer the end of warming a school room, at a uniform temperature in every part and with as little loss of heat, and as little trouble in the management, as any anthracite stove with which I am acquainted. A fire once properly kindled and regulated in this stove will require but little attention in adjusting the damper, so as to increase or diminish the draft or the temperature, as the circumstances of the school may require. The large radiating surface which is nothing more than prolonged pipe tastefully and conveniently arranged, imbibes and diffuses all the heat evolved by the combustion of the fuel, so that at the point where it enters the chimney, the heat of the pipe is scarcely preceptible.

The best mode however, at the same time of warming and ventilating a school room, especially if it is large, is by pure air heated in a stove or furnace placed in the cellar or a room lower than the one to be warmed. No portion of the room, or the movements of the scholars, or the supervision of the teacher, are encumbered or interrupted by stove or pipe. The fire in such places can be maintained without noise and without throwing dust or smoke into the room. The offensive odors and impurities of burnt air, or rather of particles of vegetable or animal matter floating in the air are not experienced. The heat can be conducted into the room at different points, and is thus diffused so as to secure a uniform summer temperature in every part of it. A room thus heated, even without any special arrangements for this object, will be tolerably well ventilated, for the constant influx of warm pure air into the room will force that which is already in it out at every crack and crevice, and thus reversing the process which is at this hour going on in every school room in the State. By an opening or rather several small openings into the ceiling, or a flue, which in either case should connect with the outer air, the escape of the impure air will be more effectually secured. By an ingenious arrangement, suggested by Prof. Reid, the House of Commons in London, is at once effectually warmed and ventilated. The fresh air is warmed in a lower room by passing over a large surface of hot iron bars (hollow and kept full of water) and is then conducted by means of tin pipes under the floor, and enters the room from a vast number of small openings. From its lightness this air is always rising, is breathed, and ascends to the top of the room, and escapes through openings in the ceiling made for the purpose. These openings all discharge into a common flue, which conducts this impure heated air down to the grate, where it is used to feed the fire. Since this arrangement was introduced the draft of the smoke chimney has been increased, the steady combustion of the coal secured, a regular and agreeable change of the atmosphere of the house kept up.

But whatever may be the mode of warming adopted, whether by open fireplace, or grate, stove for wood or coal, or furnace, the temperature of the room should be uniform, and of the proper degree in every part. Not a child should be exposed to sudden or extreme changes of temperature, or compelled when overheated or at any time to sit against an inlet of cold air, or with cold feet. This last is a violation of an indispen-

*See Bigelows Useful Arts, Vol. XI. Mass. Common School Library, p. 310.

sable condition of health. To secure a uniform temperature, a thermometer will not only be convenient but necessary. It cannot be ascertained, for different parts of a room or for thirty or forty persons, differently circumstanced as to heat or cold, or differently employed, some of whom are seated, some standing or changing their position from time to time, without some less variable and uncertain standard than the teacher's feelings. However anxious he may be to make every scholar comfortable, he cannot be conscious at all times of the differing circumstances in which they are placed. He is not exposed to the rush of cold air from a broken or loose window, or from cracks in the ceiling or the floor. He is not roasted by a seat too near the stove. He is not liable to a stagnation of the blood in the feet from want of exercise or an inconvenient bench. Even though he were capable of thus sympathizing with them, the temperature of the room after the fire is thoroughly going and the doors closed, may pass gradually from 65° to 60° without the change becoming perceptible. Now though we may breathe freely in such an atmosphere, gradually heated, we cannot pass into the open air 40° or 50° colder as would be the case on most winter days, and much less receive a current of such air on a portion, and a sensitive portion of the body, without great danger. With a thermometer in the room, the beginning and progress of such a change would be indicated, and could be guarded against. But I cannot pursue this topic further. In a climate where owing in part to the suddenness and degree of the changes of temperature, and partly to our imperfect modes of ventilation and warmth, and partly to our imprudence in dress and modes of living, so many of the young die of consumption, no precaution which will diminish the activity of any of these causes should be neglected.

We will add a single consideration more in connexion with temperature.

In our arrangements for artificial warmth especially in all stoves for burning anthracite coal, where intense heat is liable to be communicated to the iron surface if we would preserve the purity of the atmosphere at all degrees of temperature, it is necessary to secure the presence of a certain quantity of moisture. The difference between winds blowing from different quarters, as to health and comfort, is principally owing to the proportion of moisture they contain. Whenever the air has less than its due proportion, it becomes powerfully absorbent of it in every thing with which it comes in contact, whether vegetable or animal. Hence the impression of burnt air, the disagreeable sensation of dryness on the surface of the body, and the delicate membrane of the throat, the shrinking and cracking of furniture, the blight and withering of plants, which are universally experienced in a dry and overheated apartment. Most of these and other effects may be avoided by not overheating the air, but not altogether. There is a difference in the moisture of the atmosphere at different times, without reference to artificial warmth, and however careful we may be to maintain a uniform low temperature in a school room, we are liable to experience some of the inconveniences above referred to. These can be avoided, even where the room is overheated by an evaporating dish, supplied with pure water. The water should be frequently changed. The gathering and settling of dirt and other impurities in the vessel containing the water can be guarded against by closing the top except to admit a suspended linen or cotton cloth, which will absorb the water and give it out again from its exposed surface. This surface can be varied to the varying circumstances of the atmosphere.

7. *Seats and Desks.*—In the construction and arrangement of the seats and desks of a school room, due regard should be had to the convenience, comfort and health of those who are to occupy them. To secure these objects, they should be made for the young, and not for grown persons; and for the ever varying heights of children of different ages, from four years and under, to sixteen and upwards. They should be made in reference to the length of time during which they will be occupied at each session of the school, and be adapted to each other and the purposes in which they will be used, such as writing and ciphering, so as to prevent any awkward, inconvenient or unhealthy positions of the limbs, chest or spine. They should be easy of access, so that every scholar can go to and from his seat and change his position, and the teacher can approach each scholar and give the required attention and instruction, without disturbing any other person than the one concerned. They should be so arranged as to facilitate habits of attention, take away all temptation and encouragement to violate the rules of the school on the part of any scholar, and admit of the constant and complete supervision of the whole school by the teacher. These principles have been regarded here.

The general arrangement of the seats and desks in reference to the aisles are such that each scholar can go to and from his seat, change his position, have access to his books, attend to his own business, without incommoding any other person. There is no facility, or temptation to whisper or otherwise communicate with each other. No one is required from his position, or tempted by the sight or sound of passing objects in the street to look out of the windows. When properly seated, his face is turned away from the street and towards the teacher, who from his platform can survey the whole room at a glance, conduct the reading and recitations of his classes, or go to each scholar in his seat without incommoding any other.

Each scholar is furnished with a seat and desk, properly adapted to each other, as to height and distance, and of varying heights, (the seats from nine inches and a half, to fifteen and a half, with desks to correspond) for children of different age or size. The seats are so made, that the feet of every child when properly seated, can *rest* on the floor, the upper and lower part of the leg will form a right angle at the knee, and the back and shoulder blades find rest and support against the front of the adjoining desk, which reclines 2½ inches in 16, to correspond with the curves of the spine. It would have been an improvement on the seat, if it had been made more like an ordinary chair, (as in Fig. 4,) and detached from the adjoining desk, so as to have allowed the scholar or the teacher to stand up or pass behind it. The average expense would not have exceeded one dollar for each seat.

Each desk which is 2 feet long by 1 1-2 wide, is provided with a shelf for books, an opening (*b* Fig. 3,) for a slate, and another (*c* Fig. 3, for an ink stand, which is covered with a metallic lid, and a groove, (*a* Fig. 3,) along the outer line of the level portion, to prevent pens or pencils rolling off. [The slate and ink stand belong to the desk, and are furnished by the district.] The upper portion or writing part of the desk inclines one inch in a foot, and is not removed from the seat either in distance or height, so far as to require the body, the neck or the chest to be bent forward in a constrained manner, or the elbow or shoulder blades to be painfully elevated whenever the scholar is engaged in writing or ciphering. These last positions, to which so many children are forced by the badly constructed seats and desks of our ordinary school houses, has led not unfrequently to distortions of the form, and particularly to spinal affections of the most distressing character. Such marked results are principally confined to females of delicate constitutions and studious and sedentary habits. While boys and young men engage in active exercise and sport during the recess and at the close of the school, and thus give relief to the overstrained and unnatural applied muscles, and restore the spring or elasticity to the cushion like substance which gives the flexibility to the spinal column, girls exercise less in the open air, indulge but little in those sports which give variety of motions to the joints and muscles, and are confined to duties and studies which require their being seated out of school hours too much and too long at any one time.

The effects of the posture above described in writing or ciphering, are increased and even induced by their being compelled to lean against the narrow edge of the writing desk, when their faces are turned towards the teacher. This edge comes against the weakest portion of the back, and the inconvenience or pain forces those exposed to it, to find relief by resting the elbows on the desk, and thus giving an unnatural elevation to the shoulder blades—or if no support of the kind is provided, they lean against each other, support the back by closing the hands over the knee, or resort to some other awkward or unnatural position, which if long continued will cause more or less of structural deviation, amounting not unfrequently to positive disease.

Dr. Woodward in a communication appended to Mr. Mann's Report remarks:—"High and narrow seats are not only extremely uncomfortable for the young scholar, tending constantly to make him restless and noisy, disturbing his tem-

per and preventing his attention to his books; but they have also a direct tendency to produce deformity of his limbs. As the limbs of children are pliable or flexible, they are made to grow out of shape by such awkward and unnatural positions.

"Seats without backs have an equally unfavorable influence upon the spinal column. If no rest is afforded the backs of children while seated, they almost necessarily assume a bent and crooked position. Such a position often assumed and long continued, tends to that deformity which has become extremely common with children in modern times; and leads to diseases of the spine in innumerable instances, especially with delicate female children."

Dr. J. V. C. Smith, of Boston, in his Anatomical Class Book, says:—"There is a radical defect in the seats of our school rooms. Mal-formation of the bones, narrow chests, coughs ending in consumption and death in middle life, besides a multitute of minor ills, have often had their origin in the school room." Again, "to these wretched articles, viz. badly constructed seats and writing desks, are we to look in some measure for the cause of so many distortions of the bones, spinal diseases, chronic affections now so prevalent throughout the country."

Dr. Warren, in his admirable lecture before the American Institute of Instruction, in 1830, which should be in the hand of every teacher and parent, says:—"In the course of my observation, I have been able to satisfy myself that about one half the young females brought up as they are at present, undergo some visible and obvious change of structure; that a considerable number are the subjects of great and permanent deviations, and that not a few entirely lose their health from the manner in which they are reared." And among the causes which lead to such mournful results, he enumerates the unnatural elevation of the right shoulder, the habit of bending the neck, and the stooping posture of the body when engaged in writing, or similar exercises at school.

No child should under any circumstances be long, or frequently exposed to any one or all of these causes of discomfort, deformity or disease. With but a tithe of the expense or prudence which parents devote to their own comfort and health, and indeed with little or no additional expense in the outset, there would be no occasions for such exposure. Seats and desks can be as easily and cheaply made of different heights, and for convenient and healthy postures, as they are now without reference to any such considerations. If desks must be attached to sides of the room, which is objectional in respect to ease of supervision, habits of study, as well as the morals, manners and health of children, then let the seats be provided with a moveable back like those in rail road cars and in no case be made for more than two. The kind of back referred to is cheap and convenient for desks constructed and arranged on any other plan. It not only affords a proper support to the back, but will allow of the scholars standing up behind the seat for reading or recitation, or even for a frequent change of position which is so much over looked in schools, and by students of every grade. No position, if long continued, is more irksome or more unhealthy, or at least operates so insidiously, and yet directly to derange the circulation and other vital functions as sitting, especially upright, or with the neck and chest bent forward. To young children it is cruel in the extreme, and wars directly with all healthy and symetrical growth, besides ruining the temper, and imparting a lasting distaste to study, the school room and the teacher.

I cannot leave this branch of my subject without saying a few words more in behalf of those little children, and the thousands such as they who are made to suffer, and many of them permanently, from being forced to sit long in one position, without any occupation for mind or muscles, on seats without backs and so high that their feet cannot touch, much less rest on the floor. Nothing but the fear of punishment or its frequent application can keep a live child still under such circumstances, and even that cannot do it long. Who has not an aching remembrance of the torture of this unnatural confinement, and the burning sense of injustice, for punishment inflicted for some unavoidable manifestation of uneasiness and pain! Even though the seats are as comfortable as these are, young children cannot and should not be kept still upon them long at a time, and never without something innocent or useful to do, and under no circumstances longer than twenty-five or thirty minutes in one position nor so long at one study, and that with frequent and free exercise in the open air. To accomplish this, great and radical changes in the views and practice of teachers, parents and the community must take place. I know not where in the whole department of practical education the change is more needed, or should be sooner commenced. I can here only touch upon it in reference to the arrangements of the school room. If our school houses are to consist of but one room for all the children, regard must be had for the varying circumstances of the winter and summer school. In the former the larger and older children predominate, and in the latter the younger and smaller, and yet in both the younger and smaller are sadly neglected, not only in matters of instruction, but in physical comfort. In summer, they or at least a portion of them are seated "beyond soundings" on seats intended and occupied by the older scholars in winter, and in winter they are packed away on smooth, high, backless slabs, and in a roasting proximity to the fire. Now I know of no way of remedying this state of things, than by having a school room large enough to accommodate all who may attend, and to have seats and appropriate desks for all the children, be they young or old, large or small. In the winter let so many of the seats and desks for the smaller children as are not wanted be removed to the attic, or the wood-room, and their places supplied by some for the older. And in the summer let this arrangement be reversed. This change would not require a workman, in most cases, a half hour's time, or one dollar's expense, and even if it required both ten fold, it should be done.

The most effectual way of securing appropriate accommodations for children of different age and size, is to have two or more school rooms, one of which shall be for the younger, and be fitted up accordingly. At one end, with no windows in the wall, should be a platform of seats (Fig. VI.) rising one above the other, on which the children can be arranged at suitable times, for inspection as to cleanliness, for manual exercise, and for all simultaneous exercises, such as singing, simple operations of mental arithmetic, reading of scriptural and other moral stories, and lessons on real objects, pictures and other visible illustration. The gallery is an economical arrangement in respect to space and expense, and enables the children to fix their eye more easily on the teacher, and the teacher to observe, explain, be heard, and direct more perfectly every movement of the children, and both teacher and children, to profit by the great principle of social sympathy, and imitation. Along the sides of the room should be a passage at least two feet wide, and then a desk, so made as to hold a thin layer of sand (*b* Fig. V.) and receivea slate for each scholar

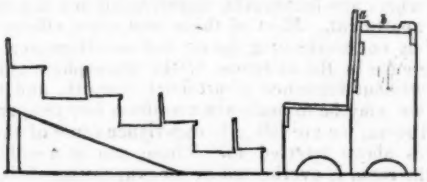


Fig. VI. Fig. V.

no matter how young. With the sand desks, and slate and pencil, models of geometrical figures, maps, diagrams, pictures and bold outlines of national costumes, the various implements of the arts and trades of life, and real objects from the animal, vegetable and mineral kingdom, a judicious teacher can train the infant and juvenile mind to correct habits of observation, which must be made the basis of all sound habits of comparison, imagination, and reflection and judgment, accustom them to the discipline of a school and to lay the foundation of correct habits, in every department of study. The center of the room should be unencumbered with fixtures of any kind, so as to allow of the arrangement of the school into drafts or classes, and the free movements of the children when necessary. Whatever may be the intellectual and moral exercises of schools for small children, they should be varied and in such a manner as to require frequent and varied physical movements—both change of position and place, from setting to standing, from desk to gallery, marching, clapping of hands, and other exercises of the joints and muscles which

shall bring them all into play, singing, &c. Even with this diversity of occupation in doors, young children, when healthy, and symetrical growth is governed by the great laws of constant and cheerful motion, require gamboling, frolicsome exercises for ten or fifteen minutes as often as every hour they are mentally occupied, in the open air if it is pleasant, or in the woodshed or other covered building in damp or rainy weather. A play ground safe from all exposure of the health and limbs of children, large enough to allow of trundling the hoop, and of free exercise of the limbs, supplied with a circular swing, &c., is an indispensable appendage to a school where children are to be reared with vigorous and symmetrical bodies. During the recess, the atmosphere of a school room, should be thoroughly renewed by the opening of windows and doors for a suitable length of time.

The thoughts which I have here briefly presented, are not new. I have seen them realized to a greater or less extent in school rooms in this country and in Europe. They are the fundamental principles of the schoolhouse arrangements, and the discipline of the schools of the Glasgow Educational Society, of the pauper school at Norwood, and of the best conducted Infant Schools in England. I cannot but regard it as a serious calamity to the cause of sound education in this country, that the Infant school system was commenced in our large cities with such ill advised haste, under teachers very well disposed, but not always properly trained for their work. The experiment proved in a great measure a failure, because too much was attempted, and that which was practical in it, was not prosecuted with sound views of the philosophy of education. I have no wish to see infant schools as they were constituted and conducted ten or twelve years ago revived, but I do wish to see primary schools, where young children of both sexes can be trained to correct habits of body, mind and heart, under the gentle and softening influences of well qualified female teachers, established in every school society and especially in every city and central village in the state.

There are two other features of a good school house which the friends of education among you, without expense to the district, have added to this structure, thereby giving it a completeness which does not belong in an equal degree to any school house in the state.

8. *Apparatus.*—Under this head I include slates, blackboards, globes, maps, diagrams, models, and other forms of visible illustration, including specimens from the mineral vegetable and animal kingdom, which may serve to educate accurately the senses and make the knowledge communicated by books, or orally by the teacher, accurate vivid and practical. The inefficiency of our school education of every name is mainly owing to the want of such cheap and simple aids, and of modes of communication based upon and adapted to them—begun early and continued throughout. Hence much that all of us acquire in schools, we have been obliged to unlearn, and more of it lies in dead, useless, unassimilated masses in the memory. It was never properly learned—it was not linked with our daily experience—it was not seen, felt, tasted, or heard in its own original sound—it was not done, no matter whether it was act of head, heart or body, it was not done by ourselves—it was not worked out by our own hands, so that process, principle and practical relations were mastered and made our own. Hence the knowledge we acquired from books or from our teachers, does not to the extent it should color our silent meditations,—it does not go with us into the field, the workshop, or any of the departments of business, but we are obliged to learn another arithmetic, grammar, history, and almost another language, both spoken and written, from what was taught in the schools. The knowledge of every day practical life is the result of self-education, the education of subsequent observation, experience and reading. Under any opportunities of self-culture, this self education must be our main reliance, and it will be useful and complete, provided our district school instruction is accurate and practical, and the habits of observation, comparison, classification, abstraction, and reasoning, are thorough and rapid. To make this instruction, and these habits, of this high character, as far as these children are concerned, the teacher if he understands the use of them, will find such aids as you have provided on these shelves eminently useful.

With the slate and black-board, there is no study from the simplest rudiments up to the highest ever pursued in our common schools, which cannot be illustrated and taught to better advantage, than without them, while there are some to whose attainment they are absolutely indispensable. It is painful to go into our schools, and see how many little children are trying to sit still, with no occupation for the hands, the eye, or the mind, who might be innocently and usefully employed, in a sand desk, or with a slate and pencil, in printing the alphabet, combining letters, syllables, or words, copying the outlines of angles, circles, solids, or maps, diagrams, real objects; thus acquiring knowledge as well as correctness of eye and rapidity of hand, which will be of great use afterwards in learning to write and draw with the pen on paper. I have found invariably that children, who begin early with the use of the slate, the blackboard, in writing, drawing, spelling, arithmetic, grammar, are more accurate, rapid and practical scholars than others much older and with better opportunities in other respects, who have not been accustomed to their use. So important do I deem the former in the hands of every pupil, that I should rejoice to see the desk of every scholar in every school supplied with one by the district, of the best quality, and for the sake of economy bound at the corners with an iron band. It should not be left to the chance supply of parents who we know are very negligent on this point, as well as in some others more essential even. In addition to a large blackboard, conveniently suspended like this, so as to admit of its being elevated within sight of the whole school for any diagram, lesson, illustration, intended for all, or lowered within sight and reach of the reciting class, there should be several smaller ones as in this school, for local and individual use.*

The *Abacus* or *numerical frame*, the *set* of *geometrical solids*, the diagrams of the same, and the *blocks* to illustrate the *cube root*, will prove highly useful not only in elementary arithmetic, but in the correct understanding of language in daily use, as well as in the measurements and practical questions in the higher departments of the same study. Instead of tables of weights and measure, diagrams or models, or real measures of every kind should be set before the scholar till his eye and hand, as well as his memory are familiar with their varied sizes and relations. And so of our national coins of different denominations.

In the study of geography and history and I may add the first principles of Astronomy, the *globe*, *tide dial*, *orrery*, *season machine*, *large maps*, *outline maps*, *historical charts*, *plan of Jerusalem*, &c., will enable your teacher, if you are careful always to provide one who understands their uses, to communicate more accurate knowledge in a school of four months, than is usually done in a twelve month, where these articles are not provided. The large beautiful maps which adorn these walls, not only gives a pleasing and attractive aspect to what ordinarily appears dingy and repulsive, but will familiarize the minds of the scholars early with the relative positions and sizes, of different countries, of which they have heard and read. With that splendid plan of Jerusalem (Catherwood's,) the bible and especially the new testament, and all the wonderful characters and events which are there recorded, will be read with tenfold interest and profit. The *outline maps*,† of the different divisions of the United States, of the Americas, of Europe, Asia and Africa, if copied as they should be by the pupils in geography, and filled up with the names of ranges of mountains, rivers, cities, will be the most useful exercise in this department. It would be better if they could begin with an outline map of Windsor, or even of

* For the various useful applications of the slate and blackboard in the hands of young children especially, see this Journal Vol. II. p. 181, "Modes of Instruction adapted to Summer Schools." In addition to the suggestions there made, we would recommend that as a general rule, the teacher require that all requests to him or her be made on the slate, both to avoid disturbance, and as a practical exercise in language, as to writing, spelling and grammatical accuracy.

† It is a matter of congratulation to all teachers and friends of schools, that a series of large outline maps by Mitchell of Philadelphia, will soon be published by Mather, Case, Tiffany & Burnham. Their introduction into schools will form as important an era in geographical studies, as did the introduction of the common atlas.

Mr. Lovell, in the Lancasterian school, New Haven, has been for years accustomed to teach geography by means of outline maps, and we have now before us some beautiful specimens drawn by his pupils.

Mr. Harrison, in the South District school, Hartford, who was a pupil, and an assistant of Mr. Lovell, teaches geography in this way, and with as much success as we have seen it pursued in any school public or private in the state. Miss Seymour, the principal of the primary department of the same school, has an interesting exercise of an half hour each day on an outline map. We can point to this school in its three departments, as in all respects one of the best in the state.

their own school district, so that they could thoroughly understand in the outset the relation which a map bears to the reality, and verify it by their own observation. They would thus also form accurate ideas of size and distance, on a scale which they would comprehend, and could then expand their conceptions by degrees so far as to embrace states, continents, the globe and the system of which it forms a part.

The study of geography and history could be made far more useful and interesting by *pictures* representing the great curiosities of nature and art, views of cities, and other spots memorable for great events, the manners, dress, edifices, ruins &c., peculiar to each country. One set of plates, could answer very well for all the schools of a society and pass in succession through the several districts.

For the study of the natural sciences, and there is no study which can be made more useful or delightful in the hands of a judicious teacher, cheap collections of minerals, and specimens or drawings of plants and animals, would be not only useful but necessary. In this department the children could collect their own cabinets, and interchange of specimens between different districts and towns be effected. But this suggestion will seem so far beyond the practical, that I will leave it here. My own conviction is however, that many of the hot days of summer had better be spent in the fields, or the woods in search of the beautiful things which God has scattered over the earth and through it, even without a teacher, and much more with one who has a taste for natural science, than in the best unshaded school house of many of our districts.

The Magic Lantern in almost any of its improved forms, and especially in Carpenter's, is accompanied with diagrams to illustrate astronomy, natural history, cities, landscapes, costumes, &c., which bring the objects and truths represented, so vividly before the young that they can never forget them.

9. *Library.*—The teachers, scholars and adults generally, of every district, should have access to a library of well selected books for reference and reading, in connection with the studies of the school, and the various departments of useful knowledge. The teacher should be able to extend his own acquaintance with the studies pursued, and to illustrate and explain any name, date, event, terms of art or science, or other allusion or question which might occur in the regular lesson, or which the natural curiosity of children, if encouraged, would suggest. Above all should he be furnished with the best books which have been published on education, and especially with that class which have special reference to the duties and labors of the school room, and have been prepared by experienced and successful teachers. Children, even the youngest should be provided with such books, adapted to their eye and capacity as will invest their studies with new interest, help them to observe and understand what they see and hear by the road side, in the field and in their daily conversations, and form a high standard to aim at in manners, morals and intellectual attainments. Many an idle hour would thus be redeemed, and the process of self-culture be commenced, which would go on long after their school life was ended. To ensure this, the farmer, mechanic, manufacturer, and in fine, all the inhabitants of a district, of both sexes, and in every condition and employment of life, should have books which will shed light and dignity on their several vocations, help them better to understand the history and condition of the world, and country in which they live, their own nature, and their relations and duties to society, themselves and their Creator. All that is wanted to fill the community with diligent and profitable readers among all classes, is to gratify the natural curiosity of every child "to know," to convert that curiosity into a well regulated taste, and confirm that taste into a habit, by easy access to a library of appropriate books.

Without such books the instruction of the school room does not become practically useful, and the art of printing is not made available to the poor as well as the rich. The rich can always command more or less of the valuable works which the teeming press of the day is throwing off, but the poor must depend for their reading on such books as public libraries easily accessible, or the benevolence of more favored individuals may supply. Wherever such libraries have existed, and especially in towns blessed with a school of a higher order than the district school, and a clergyman of the right stamp, there the abundant fruits have been seen, in the number of educated young men, who have gone forth from families poor in worldly wealth, and in the general intelligence, virtue, and public spirit which has prevailed. Most of the eminent and useful men in public or private life among ourselves, or who are now filling the ranks of the prosperous and eminent in other states, owe their ability and their success to an early taste and habits of reading, fostered by these libraries, and directed by the judicious advice of the educated clergyman. Without intending any invidious distinction, to what other causes can we assign the high state of general intelligence and virtue which have and still prevail, and the number of educated and eminent men who were reared in the towns of Salisbury, Lebanon, Farmington, Pomfret, New Canaan and Washington, than to the agency of good teachers, good books and good clergymen with which they have been blessed. Wherever these agencies have been felt, and especially where they have been found operating together for any considerable time, there talent and virtue which might otherwise have been buried under the disadvantages of poverty and ignorance, have been called forth, to elevate, bless and purify society. It is painful to see how many of the social or society libraries, which have at different times existed in almost every town in the state, have been scattered or sold, or are now miserably dilapidated, forsaken, or in a moulded condition. The departure of our educated and enterprising young men to the west, has in no department been more disasterously felt, than the consequent neglect of these libraries. Their places with the rich, or with the few who are willing to make some sacrifice of luxuries, or even comforts, for this object, are supplied by private libraries and with children of all classes who attend sunday schools, by the libraries attached almost universally to them. The former however can benefit but comparatively few, and in no case those who need them most; and the latter are expressly intended for the young and do not embrace the wide range of duties and interests into which they enter and become connected as they grow up to be the men and women, the parents, citizens, neighbors and business men of every name and relation in society. Such social libraries as still exist in a flourishing condition, are removed from many families whose children need them most, and are burdened with a quarterly or annual tax which effectually excludes the abject poor, and many more, who though abundantly able, feel themselves too poor to spend a trifle in clothing and feeding the spiritual nature of themselves, and their children. The district school library system, either in the form in which it has been adopted in New York, or in the modified form in which it might be adopted in this State, obviates all these dificulties of distance and expense, and carries the blessings and advantages of good books to every point where there are families enough to maintain a school. In New York, one hundred and six thousand dollars a year for the space of five years, ending in 1843, must be expended in the purchase of books, and these books are to be placed, not in a few colleges, or cities, or towns, but in every common school scattered through every one of her ten thousand districts. Well may Governor Seward exclaim :—

"Within the five years limited by the law, there will have been expended, in the purchase of books, more than half a million of dollars. Although an injudicious choice of books is sometimes made, these libraries generally include history and biography, voyages and travels, works on natural history and the physical sciences, treatises upon agriculture, commerce, manufactures and the arts, and judicious selections from modern literature. Henceforth, no citizen who shall have improved the advantages offered by our common schools, and the District Libraries, will be without some scientific knowledge of the earth, its physical condition and phenomena, the animals that inhabit it, the vegetables that clothe it with verdure, and the minerals under its surface, the physiology, and the intellectual powers of man, the laws of mechanics, and their practical uses, those of chemistry and their application to the arts, the principles of moral and political economy, the history of nations, and especially that of our own country, the progress and triumph of the democratic principle in the governments on this continent, and the prospects of its ascendency throughout the world, the trials and faith, valor and constancy of our ancestors, with the inspiring examples of benevolence, virtue and patriotism exhibited in the lives of the benefactors of mankind. The fruits of this enlightened and beneficent enterprise are chiefly to be gathered by our successors. But the present generation will not be altogether unrewarded. Although many of our citizens may pass the District Library, heed-

less of the treasure it contains, the unpretending volumes will find their way to the fire-side, diffusing knowledge, increasing domestic happiness, and promoting public virtue."

The advantages here set forth, will I hope ere long be within the reach of every school district in Connecticut, in this improved form. The money, appropriated from the avails of the school fund, or raised by tax, say to the amount of 20 cents on every child over 4 and under 16, should be expended by a committee of the town or school society, and the books purchased, divided into as many district libraries as there may be groupings of families or districts, and each library pass in succession through them all. In this way there will be the interest of novelty kept up, and each district will have the selection of a much wider range of books. Although there may be two or three, and sometimes five thousand volumes in any town, under the present system in New York, there will not probably be two hundred different authors; under the system proposed, there need not be any duplicates except a few standard authors or books of reference.

But whatever may be done by the State at large, or other districts, I am happy to congratulate the teacher, children, and inhabitants of this district generally, on their having access to a library embracing as wide a range of reading, appropriate to teacher, children and adults as that set forth by Governor Seward, and far more so than any other district in this state.

Let me, then, commend this library to your particular attention. Convert it into a bond of union, as the common source of your evening and fireside pleasures. Let its precious volumes become in turn the inmates of every family, and although you may not thus entertain angels unawares, you may each and all of you share the society of the greatest and best of our race, even though they may be distant or dead.

Such are the advantages of a good schoolhouse properly heated, arranged, and furnished. My hope is, that parents and the friends of education generally, in this vicinity and elsewhere, will be induced by what you have done, to look into the existing deficiences of their own schoolhouses, and apply the same common sense to their improvement which they have carried into every other structure for public or domestic use.

* * * * *

But important as it confessedly is, for the district to furnish a good schoolhouse, still parents, teachers and children have duties to perform before this can be made a model school.

The State too has an important work to do, upon which it has not yet entered. Opportunities must be afforded to our young men and young women, to prepare themselves for the high and holy office of teachers, and when they have become duly prepared, their intelligence, industry and experience must be remunerated as in other walks of life.

In preparing the above remarks for the press we have consulted such authorities as were within our reach, in order to give the latest and best received views on the subject of schoolhouse architecture and furniture. We are largely indebted to Dr. William A. Alcott, not only for the views presented in his Prize Essay in 1831, but for his later communications in the Journal of Health, in 1840, under the head of "Health in common schools." In that series of articles, based on facts and opinions gathered from the reports of school committees, in the Massachusetts School Returns for 1839, he has in a plain, practical, unanswerable manner exhibited the defects existing in schoolhouses in regard to ventilation, temperature, and seats and desks. His lecture before the convention of teachers, which met in Hartford in November 1830, on schoolhouses was the basis of his Prize Essay, and led to some inquiries and improvement. Dr. Alcott was the leading pioneer, writer and speaker on this subject. The report of Mr. Mann, in 1838, contains, however the most eloquent and philosophical as well as practical view of the whole subject, and by means of this Journal, has been widely disseminated through this state.

In Massachusetts the lectures, discussions and publications of the American Institute of Instruction, the example of Boston, and other large towns, the reports and addresses of Mr. Mann, have led to the erection of more improved schoolhouses than can be found in any other state.

We shall devote a half number of the Journal to a catalogue of the several school libraries which have been presented to the district, and to a portion of N. B. Chamberlain's, and of Prof. Haskell's, catalogue of apparatus.

NOTE—HISTORY AND PROGRESS OF SCHOOL DISTRICT LIBRARIES.

The District Library system owes its origin and sudden extension, in a great measure, to the unwearied efforts and liberality of a native of Connecticut, Gen. James Wadsworth, of Geneseo, New-York. By his suggestion and efforts, aided by several gentlemen, members of the Legislature, the re-publication and distribution of Hall's "Lectures on School Keeping," among the different school districts, was effected. These lectures were widely read by teachers and parents, and led to the very natural idea, of supplying all of the children, as well as the teachers and parents of districts, with other books suited to their capacity and wants. This led to a correspondence on the part of General Wadsworth, with his friends at Albany, which resulted in the recommendation, by General Dix, then the enlightened superintendent of common schools, in his annual Report in 1833–4, of a measure for the establishment of school district libraries. The recommendation was not acted upon until 1835, when through the exertions principally, of Mr. Tracy, in the Senate, and Mr. Patterson, in the House, school districts were authorized to raise twenty dollars by tax, for this object. Unwearied efforts were made to induce the inhabitants of school districts, to raise the sum necessary to purchase a suitable number of books to constitute a library. Gen. Wadsworth offered to pay one-fourth of the twenty dollars in all the districts in Avon and Geneseo. The proposition was received with cold indifference. Twenty dollars were offered to the first five districts in Henrietta, which should act under the law, but the offer was not accepted for several years. The Rev. Mr. Page, was induced to visit and give lectures on the subject in all the towns of Livingston county, but with little apparent success. I have had these facts from those who were the early and ardent friends of this measure, and who were almost ready to despair of seeing any thing accomplished, so long as the work was at the option of men, ignorant and parsimonious, who either could not or would not appreciate the importance of making provision for spiritual and intellectual wants in themselves or their children—wants of which they were unconscious, or which they valued less than those which were temporal and physical. In 1838, Governor Marcy, in reference to the disposition of the United States Deposit Fund, recommended that a portion of its avails should be appropriated to each district, which should raise by taxation an equal amount, for the establishment of a district library. This portion of the message was referred to the Committee on Colleges and Common Schools, of which on the part of the House, the Hon. D. D. Barnard was chairman. In the report from his pen, the education and employment of competent teachers, as the first great feature of any system of public instruction, and then the establishment of libraries of well selected books in each district, were discussed in a masterly manner. In the bill accompanying the report, more than $100,000 was appropriated for the last object. With several modifications, all of which were calculated to impair the efficiency of the original proposition, the recommendations became the glorious Library law of 1838, by which $53,000 a year, for three years, were appropriated from the public treasury, and the same amount, raised by direct tax, for the purchase of books in the several districts of the State. In 1839, the operation of the law was extended to five instead of three years, which will require, before the close of 1843, the expenditure of *five hundred and thirty thousand dollars*, and lead to the purchase of more than *two millions* of volumes. I know of nothing in the annals of modern legislation, morebroadly beneficent than this—nothing even in the legislation of the same State in reference to her gigantic system of internal improvements, so well calculated to develope all the resources of her soil, to carry intelligence to the workshop, the counting room and every department of business, and scatter the pleasures of knowledge broadcast over the State.

The Superintendent, Hon. John C. Spencer, in his last annual report, thus speaks of the first fruits of this legislation.

"It appears that the number of volumes in the libraries on the 31st December, 1840, was 422,459, and that there had been received and expended during that year for the purchase of books, $94,998.56; which gives us the average expense of each volume, about 45 cents. From the information received at this office, it is believed that the selections have generally and almost universally been of useful and proper books. The three series published by the Messrs. Harper & Brothers, have been chiefly chosen, and it is believed that a better choice could not have been made.

It is impossible to contemplate the fruits already realized from this part of our system of public instruction, without the highest gratification. The circulation of half a million of valuable books, among our fellow-citizens, without charge and without price, is a greater benefaction to our race than would be the collection in any one place of ten times the number of volumes. And when we reflect that in five years there will be two millions of such books in free and constant circulation among those who most need them and who are most unable to procure them, whose minds will thus be diverted from frivolous and injurious occupations and employed upon the pro-

ductions of the learned and wise of all ages, we shall find ourselves unable to set bounds to the mighty influences that will operate upon the moral and intellectual character of our State.

No philanthrophist, no friend of his country and her glorious institutions, can contemplate these results, and the incalculable consequences they must produce, upon a population of nearly three millions of souls, without blessing a kind Providence for casting our lot where the cultivation and improvement of the human mind, are so eminently the objects of legislative care, or without feeling that every citizen in his station is bound to forward the great work, until we are as intelligent, as we are free."

The example of New York has already had its influence on other States.

The constitution of Michigan makes it the duty of the Legislature to provide for the establishment of libraries, as soon as the circumstances of the State will permit.

The Legislature of Massachusetts in 1837, authorized the expenditure of twenty dollars by each school district, for the purchase of a District School Library. To supply the want of books suitable for this purpose, the Board of Education have caused to be prepared a collection of books to be entitled "THE SCHOOL LIBRARY."—The Library is to consist of two series—one for children of ten or twelve years of age and *under*; and the other for advanced scholars and their parents.

The Legislature of New Jersey has made a similar provision for the establishment of these Libraries; and the Trustees of the School Fund have made a selection of 50 volumes, and recommended them to the districts, under the name of the "New Jersey School Library."

In 1839, the Legislature of Connecticut made a similar provision, but as it is left optional with the District to act under it or not, but little has as yet been accomplished, and that through individual liberality.

NOTE.—LENGTH OF SCHOOL SESSION FOR SMALL CHILDREN.

Since the remarks on page 116 were in type, we have received Mr. Mann's "Fourth Annual Report" &c., in which the same view is taken of the schoolhouse arrangements and discipline for small children. He has fortified his opinions by the opinions of Drs. Woodward, Jackson and Howe.

The following are extracts from the communications referred to, in reply to the question proposed by Mr. Mann—"What is a suitable length of time to confine children under six or eight years of age in school, during the day; and what is the suitable length for one session without recess?

DR. WOODWARD, OF WORCESTER.

Children under eight years of age should not usually be confined to the school room more than one hour at a time, nor more than four hours in a day.

These hours should afford considerable diversity of employments, so as to enable the child to change his posture frequently, and to be more or less upon his feet; and, also, to change the subject of thought, so that the mind shall not be occupied by one subject too long or too intensely.

Intensity should be carefully avoided; it leads directly to disease of the brain, and often probably *arises* from this cause. Precocity is generally the result of a morbid condition of this organ, either *functional* or *organic;* the *former* may generally be cured by timely attention, the *latter* exhibits itself in epilepsy, insanity, or an imbecility of mind, or proves fatal, by the occurrence of inflammation or convulsions.

If a child exhibits any symptoms of precocity, it should be taken immediately from books and be permitted to ramble and play in the open air, or engage in manual labor and such amusements as will give rest to the mind, and health and vigor to the body.

The recess at school, for children of eight years and under, should be long, the play active and even noisy, (for the lungs acquire strength by exercise as well as the muscles,) every child should be required to unite in the sports of play time.

Fifteen minutes is short time for recess; half an hour is better, particularly in summer.

During recess, the school room should be thrown open in warm weather, and the windows be dropped a little way in cold weather, so as thoroughly to ventilate the apartments. We have hardly learned yet that pure air is equally as important to health and life as good nourishment and pure water.

In school regulations, regard is usually had to mental and moral improvement only. We forget that we have bodies, the preservation and training of which are not less necessary to the young, than the acquisition of knowledge. Without health, we can have little enjoyment. With it we can learn all that is necessary, with ease,—if we are not in too great haste. No limit is given to the age in which the vigorous and healthy may acquire useful knowledge.

It is of little use to make great acquirements, if in doing so, we sow the seeds of disease that will destroy the happiness and usefulness of life.

DR. JACKSON, OF BOSTON.

I think four hours, in the short days, and five hours, in the long days, may safely be devoted to school, even at this early age, especially in those over five years. But you will see I have changed a word; I do not say, confined in school, but devoted to school. Perhaps in the country where children go some distance from home, and do not go all the year, six hours are not too much even for young children, in days not shorter than ten hours; i. e. ten hours of sunshine.

But I do not think it wise to *confine* children *in school*, so many hours in a day as I have mentioned. On the other hand, I regard it as essential that they should not remain in school more than one hour, at a time, on an average; that, during that hour, they should not be confined in one position, but, if possible, be engaged in short lessons, and short recitations, so as to have a diversity of employments; or in other ways have some variety; and that an hour's confinement should be followed by a recess of fifteen minutes. In very young children (3 to 5,) the period of confinement should be shorter, and the recess longer. I take it to be easy to occupy young children usefully in school, without books and without perfect quiet, a part of the time, and this is done at the present day to some extent. It is to this notion I refer, when I speak of other variety, than is afforded by book study and recitation.

In children, restraint in one position, except lying down, soon produces fatigue; not because they want to be at play, but because they are obliged to keep in constant action those muscles, by which the head and trunk are supported. This, at least, is one reason, an important one, and perhaps the principle one. I feel assured, that the lateral flexure of the spine in young girls, so much noticed, the last thirty or forty years, is to be attributed much more to the effort to sit upright too long, than to tight lacing, &c. You will not suspect me of being an advocate of this vile practice, but I cannot charge to it an evil, which has commonly occurred before that practice is begun.

Children should not, then, be confined long to one position; when sitting or standing, they should not be required to maintain constantly an erect position of the body; for their muscles require more frequent alternations (each one by itself,) than those of adults.

I believe, that what I have said of too long-continued exertion of any one muscle, or set of muscles, in sitting still, or in exercise,—in the case of young children,—will apply to too long-continued devotion of the mind to any one object, or in any one mode. This must be injurious to young children, as in its proportion it is to older children and to adults; the difference, however, being very great between young children and those approaching adolescence. But I do not believe, that much harm is done in this way; for I much doubt whether young children can often be made to devote their minds intensely to study for a long time, uninterruptedly. "A boy may lead a horse to water," &c. A schoolmaster may keep a boy, under eight years of age, in his seat, and *over* his book, for two hours at a time; but he cannot, as I believe, often succeed in keeping his mind occupied in study for half an hour, or not more. As regards health, then, it is the confinement in school, and in one spot, for too long a time, which is mostly injurious.

I am greatly in favor of sending children to school, at a very early age; when three years old, if in good health. But the benefits which I look for, and which seem to me very valuable, are not such as would be increased by studying lessons at home. I would have such young children gradually taught to sit still and study, but it should be for a very few minutes at a time, at first, and without restraining them, or attempting to restrain them, for any length of time, from whispering to each other. They will do this, and if forbidden, they only learn that they may disobey with impunity. But what are the benefits I look for, from this early schooling? They are the gradual accustoming of children to discipline, and to the confinement of school so as to prepare them for their future course; but still more the bringing of them into the company of their peers. This last is of the greatest importance, as regards the physical, intellectual and moral education; and I think you may trace great evils, from the want of it, in all children brought up at home; and the earlier it is begun the better.

I must say a word about the recess. One would desire, that, during the recess, children should have a large and dry play-ground, sunny, and protected from the north and east, and having ample shade from trees. In cities, this cannot be afforded. Seldom can a good yard be allowed them. It is, however, essential to give them a turn in the open air, and not to let this be in a cellar-like yard, on the north side of a house. Where there is nothing better, the children should go into the street, a few at a time, when the weather is good; and in bad weather, (when it rains or snows,) they should have a pleasant play-room; or in default of this, be allowed to use the school room as such.

We shall insert the reply of Dr. Howe hereafter.